

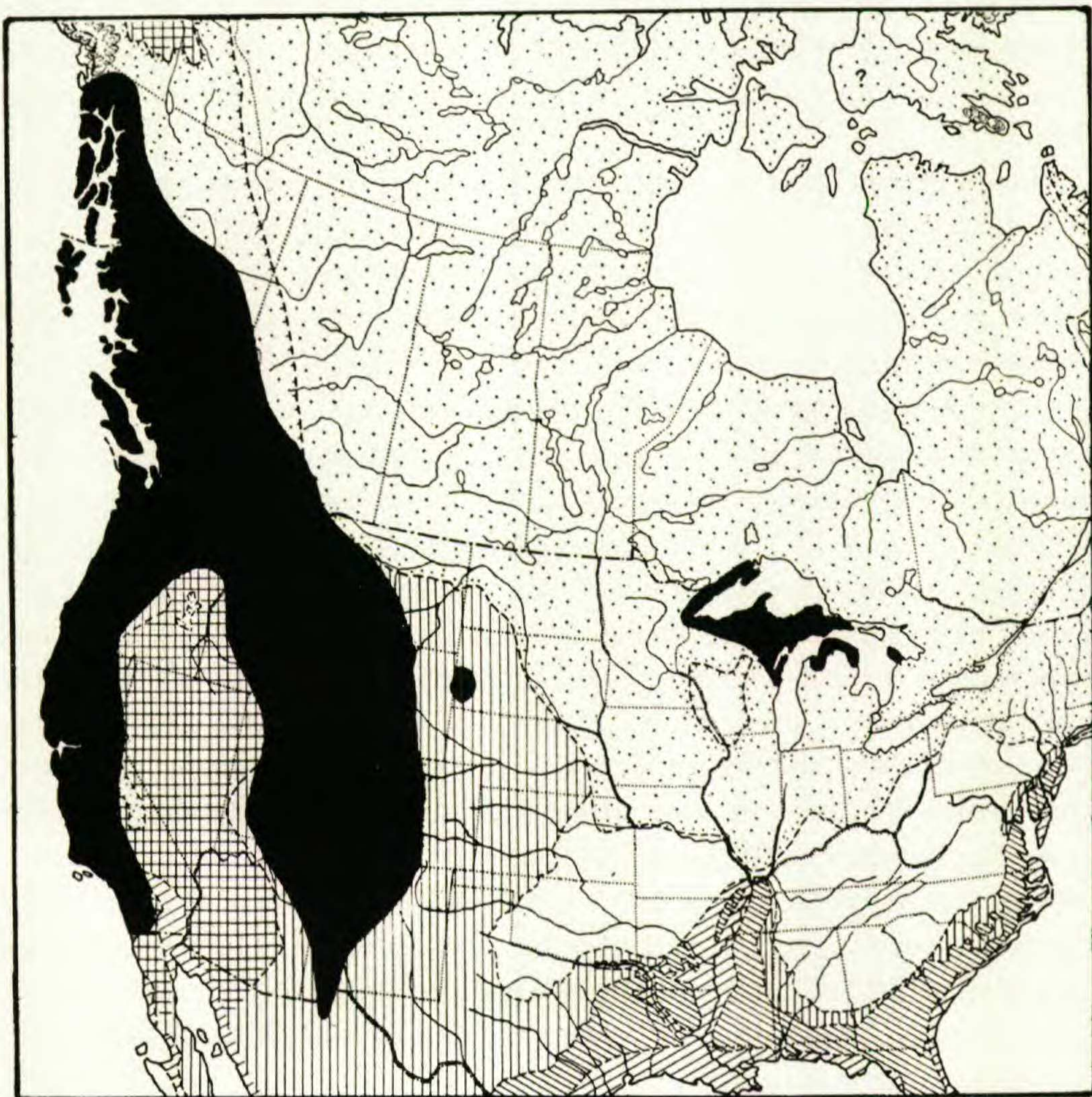
CRITICAL PLANTS OF THE UPPER GREAT LAKES
REGION OF ONTARIO AND MICHIGAN

M. L. FERNALD

(Continued from page 262)

CRATAEGUS DOUGLASII Lindl. ONTARIO: shore of Lake Superior, Agawa Bay, Algoma Distr., *Pease*, no. 18,050. MICHIGAN: wind-swept sandstone-conglomerate crest of Lookout Mt., Keweenaw Co., no. 3374.

Already known from northern Michigan, from Michipicoten Island, Lake Superior (Thunder Bay Distr., Ontario) and from Abitibi River (between outlet of Lake Abitibi and mouth of Black River—Nat. Herb., Ottawa) in Cochrane District. Otherwise known as a typical shrub or small tree of the Pacific slope (California to southern British Columbia) eastward across Idaho to western Montana and Wyoming.



MAP 14. Range (generalized) of *RUBUS PARVIFLORUS*, including all Varieties.

RUBUS PARVIFLORUS AND ITS VARIETIES (PLATES 363–365).—The beautiful white-flowered *Rubus parviflorus* Nutt. (PLATE 363), the “Thimbleberry” of the Upper Great Lakes region, is there isolated from the Black Hills and the Rocky Mountains, whence it extends to the Pacific, where it is better known as “Salmon Berry.” Realizing the improbability that a species of *Rubus* would remain constant or unvarying over the vast and diverse area (MAP 14) from the coast of southern Alaska to southern California and throughout much of the cordilleran region southward into Mexico and isolated about the Upper Great Lakes, I have felt it important to study with care the large accumulation of material in the Gray Herbarium; and as the study progressed I have borrowed the material from the two Great Lakes states most concerned, Michigan and Wisconsin, and here express my appreciation to Professors Ehlers, Darlington and Fassett for the use of the extensive collections in their charge, which have proved indispensable in working out the variations which reach “the Manual range.” It would have been advantageous to see more extensive collections from the Rocky Mountain area and the Pacific slope but the immediate problem chiefly concerned the shrub of Ontario, Michigan, Wisconsin and Minnesota; and the treatment here proposed may readily be adapted to the more continuous western region.

Focke, treating the species as *Rubus nutkanus* Moçino (1825) instead of *R. parviflorus* Nutt. (1818), recognized three varieties but, even with these removed, he described the inflorescence with “setae glanduliferae nunc flexilis, longae, glutinosa, nunc brevissimae, ita ut glandulae sessiles evadant.”¹ And Rydberg, although separating *R. parviflorus* and *R. odoratus* L. as a genus *Rubacer* Rydb. (1903), set off from *R. parviflorus* only one of its eight components and that as a species, *Rubacer tomentosum* Rydb., a renaming of *Rubus velutinus* Hook. & Arn. (1832), not Vest (1823). For the remaining highly variable elements of *Rubus parviflorus* Rydberg described the “inflorescence more or less glandular hispid and often more or less puberulent,”² overlooking the significant fact that the “more . . . glandular” inflorescences do not occur in the Rocky Mountains, while the “less glandular” ones (to the extent of complete loss of glands) are restricted to the Rocky Mountain region and are absent from the Pacific coastal region and from the Great Lakes area.

In fact, a study of the indument of pedicels, calyx and leaf-surfaces

¹ Focke, *Biblioth. Bot.* lxxii. 124 (1911).

² Rydb. *N. Am. Fl.* xxii. 426 (1913).

shows that *Rubus parviflorus* consists of at least eight more or less localized trends, quite comparable with the geographic varieties of *R. idaeus*,¹ which Rydberg, in the North American Flora, maintains as twelve species separated on parallel differences in the indument. It is, furthermore, a disconcerting but indisputable fact that these very differences in the distribution of glands in the inflorescence and of pilosity on the calices, branches and leaves or the absence of glands and pilosity from these areas, which mark the eight geographic segregates of *Rubus parviflorus*, are precisely the characters which are shuffled and reshuffled to add to the ever increasing score of "species" of Blackberry (*Rubus* § *Eubatus*)! In *R. parviflorus* not even our most ardent advocates of specific segregation, who have felt competent to make generic segregates, have noticed them; nevertheless, they are quite as conspicuous in *R. parviflorus* as in segregates of *Rubus* § *Eubatus*, and if their phylogenetic importance is of equal value in the two sections, the Blackberries are eventually due for a pretty drastic realignment.

The greatest extremes in the series of intergrading varieties of *Rubus parviflorus* are var. *velutinus* (Hook. & Arn.) Greene (PLATE 364, FIGS. 3 and 4) and var. *scopulorum* (Greene) (PLATE 364, FIG. 5). The former has the leaves pilose on both surfaces, very densely so and somewhat whitened beneath; the branchlets and pedicels long-pilose or villous among the elongate, dark glands; the calyx densely villous on the outside, the villi overtopping and mostly hiding the glands. This extreme is confined to the Pacific Slope, mostly of California; but also on the Pacific slope we find other variations connecting gradually with series with glabrous leaves, pedicels glabrous or short-pilose and with very short glands, and calyx glandular or glandless and not villous. East of the range of var. *velutinus* there occurs var. *scopulorum*, with leaves quite glabrous beneath, the pedicels quite glandless or with minute and scattered sessile glands; and in the southern Rocky Mountains var. *scopulorum* gives way to a dwarf extreme, var. *parvifolius* (Gray) (PLATE 365, FIGS. 1-3) in which the leaves are mostly glabrous and the pedicels decidedly so. Contrasted with the reduction or loss of glands in some Rocky Mountain extremes (though a wide-ranging variety with short stipitate glands (PLATE 365, FIG. 4) also occurs there) we have the great development of long stipitate glands (PLATE 364, FIG. 6 and 365, FIG. 4) on much of

¹ For revision of *Rubus idaeus* and some of its varieties see Fernald, RHODORA, XXI. 89-98 (1919).

the material of the Pacific Slope and about the Upper Great Lakes. These varieties need not here be discussed but it becomes necessary to determine the exact significance of the two original specific names, *R. parviflorus* Nutt. Gen. i. 308 (1818) and *R. nutkanus* Moçino ex Seringe in DC. Prodr. ii. 588 (1825).

Singularly enough, true *Rubus parviflorus* (var. *genuinus*) is the rarest and most highly localized of the varieties. In view of the prevalence about the Upper Great Lakes of variations with glandular-hispid calices, it is surprising that Thomas Nuttall originally got hold of a very rare extreme, with the calyx densely white-villous, as in the Californian var. *velutinus*. Nuttall, who chose a most unhappy name for one of the largest-flowered species of the genus, gave this account.

* *parviflorus*. Shrubby and unarmed, leaves simple, palmately lobed; peduncles 2 or 3-flowered; flowers small; segments of the calix villous, ovate, abruptly acuminate; petals oblong-ovate, white. HAB. On the island of Michilimackinac, lake Huron.—Nutt. Gen. i. 308 (1818).

Just such a shrub, with the calyx densely white-villous (PLATE 364, FIGS. 3 and 4), is represented before me by a specimen collected on Mackinac Island in July, 1881 by T. E. Boyce. I have seen no other material like it from Mackinac Island; but it is in the herbarium of the Michigan State College from a single area (Gogebic Co.) on the Upper Peninsula of Michigan and in that of the University of Wisconsin from three counties in northern Wisconsin. The identity of *R. parviflorus* (var. *genuinus*) is, therefore, clear. Its nearest relative, it is noteworthy, is the Californian var. *velutinus*, rather than the other varieties which occur about the Upper Great Lakes.

The identity of *Rubus nutkanus* is not easily made out from the description. Seringe, taking the name from a manuscript of Moçino, graciously ascribed it to the Spanish botanist; but Seringe's description needs special interpretation. It was as follows:

92. R. NUTKANUS (Moç. pl. Nutk. icon.) caule fruticoso inermè glutinoso, ramis teretibus glabris rufis, foliis 5-lobis inaequaliter dentatis floribus subcorymbosis subquaternis, laciniis calycinis ovatis glabris longè acuminatis corallam aequantibus . . . in Americâ boreali. Aff. R. odorato sed pedunculi calycesque glabri. Fl. albi. Fruct. ign.

Nootka (or Nutka) Sound is on the west side of Vancouver Island. No form of *Rubus parviflorus* known in the region from Sitka to California has *glabrous* peduncles, all of them being copiously glandular. Consequently, in interpreting the description it is necessary to take into account the romantic and not-too-well-known history of the plates (*icones*) of Moçino and Sessé. Very briefly, these drawings

(not botanical specimens), brought by a Spanish student to Geneva and then peremptorily ordered returned to Madrid, were hastily copied by artistically inclined ladies for their friend, A. P. De Candolle; and the many descriptions from the drawings of Moçino and Sessé were actually made, not from the original specimens or even the original drawings, but from the hastily made copies. A tracing of the copy of *R. nutkanus* at Geneva is in the Gray Herbarium. Although not exactly identifiable as to variety, it is certainly *R. parviflorus*. I am accordingly recognizing the plant (PLATE 365, FIG. 4) of the Pacific slope with least obvious pubescence as standing for *R. nutkanus*. In 1929, Farwell, without designating any of the characters used in this paper, substituted for *R. nutkanus* the name *R. parviflorus*, var. *grandiflorus*.

As I view *Rubus parviflorus* it falls into the following geographic varieties. In citing specimens those not in the Gray Herbarium are indicated as follows: University of Michigan (Mich.); Michigan State College (Mich. State); University of Wisconsin (Wisc.); Arnold Arboretum (Arn. Arb.).

- a. Glands of the pedicels all or nearly all stipitate. . . . b.
- b. Calyx-lobes densely long-villous with pale trichomes hiding the glands; leaves mostly soft-pubescent to touch beneath; glands of pedicels long and unequal. Petioles and young branches sparsely short-pilose to glabrous except for the stipitate glands; leaf-blades glabrous or glabrate above, green beneath. 1. Var. *genuinus*.
 - Petioles and young branches copiously long-pilose to villous among the glands; leaf-blades soft-pubescent to touch above, the young whitish-velutinous beneath. 2. Var. *velutinus*.
- b. Calyx-lobes puberulent, minutely tomentulose or glandular-hispid, not long-villous. . . . c.
- c. Glands of pedicels and peduncles very unequal, mostly dark-colored, the longest often 1-2 mm. long. Lower surfaces of leaves with soft divergent pubescence (soft to touch) abundant. 3. Var. *hypomalacus*.
 - Lower surfaces glabrate to glabrous, not obviously soft-pubescent to touch. 4. Var. *heteradenius*.
- c. Glands of pedicels and peduncles mostly subequal and short, often pale, rarely more than 0.5 mm. long, longer scattered glands when present rarely more than 1 mm. long. Lower surfaces of leaves with soft divergent pubescence (soft to touch) abundant. 5. Var. *bifarius*.
- Lower surfaces of leaves glabrous or soon glabrate. 6. Var. *grandiflorus*.
- a. Glands of pedicels all or nearly all sessile or subsessile or even wanting; leaves glabrous or only minutely and sparsely pubescent beneath. Shrubs mostly 1-2 m. high; leaves mostly 1-3 dm. broad, glabrous beneath; inflorescences 3-7-flowered, their lowest pedicels 1-3.5 cm. long. 7. Var. *scopulorum*.

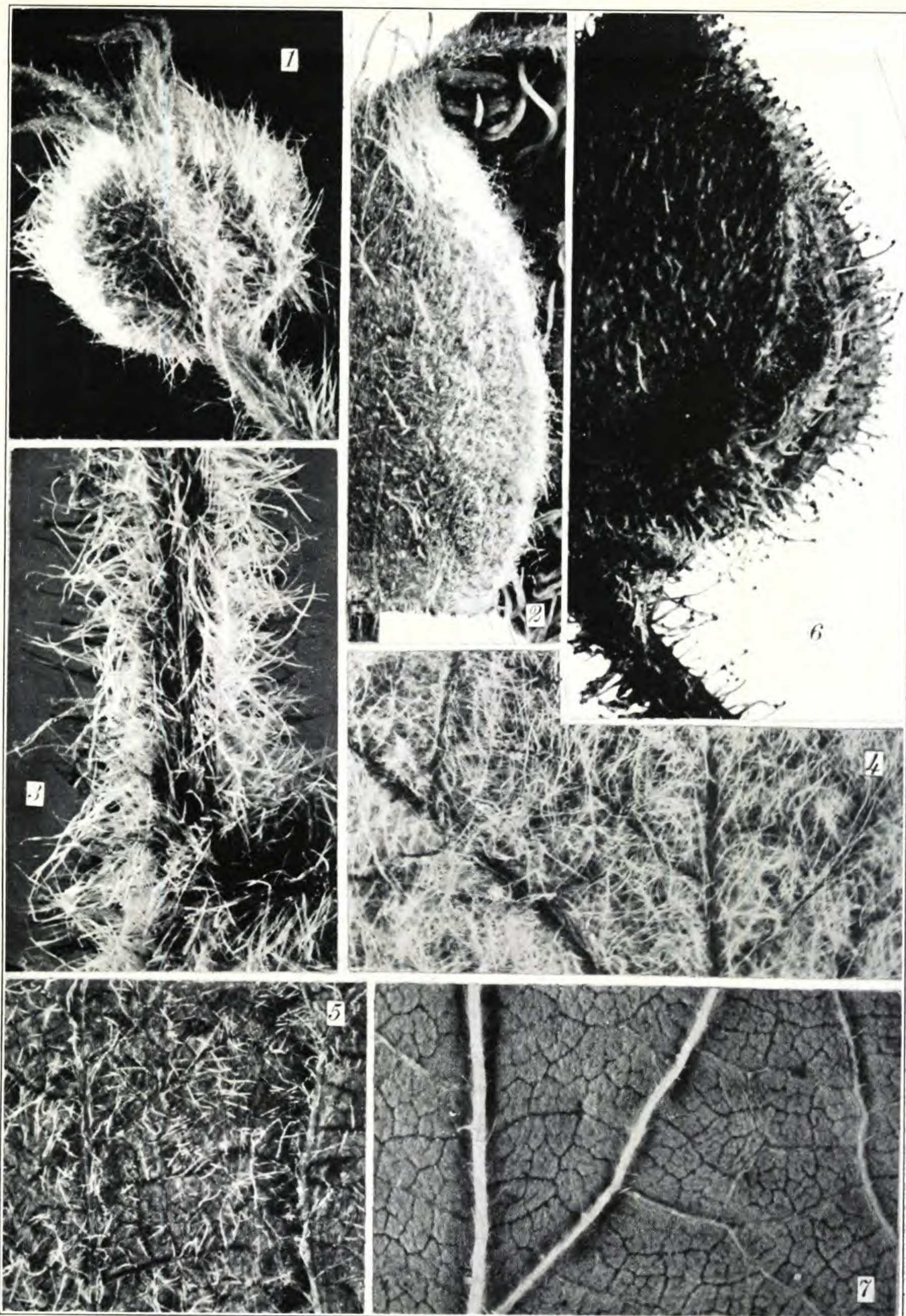


Photo. E. C. Ogden.

VARIETIES OF *RUBUS PARVIFLORUS*; all figs. $\times 10$.

Var. *GENUINUS*: FIG. 1, young calyx; FIG. 2, portion of sepal; both from Michigan.

Var. *VELUTINUS*: FIG. 3, peduncle; FIG. 4, lower surface of leaf; both from California.

Var. *HYPOMALACUS*: FIG. 5, lower surface of leaf from Washington (TYPE).

Var. *HETERADENIUS*: FIG. 6, pedicel and calyx, from British Columbia; FIG. 7, lower surface of leaf, from Washington (TYPE).

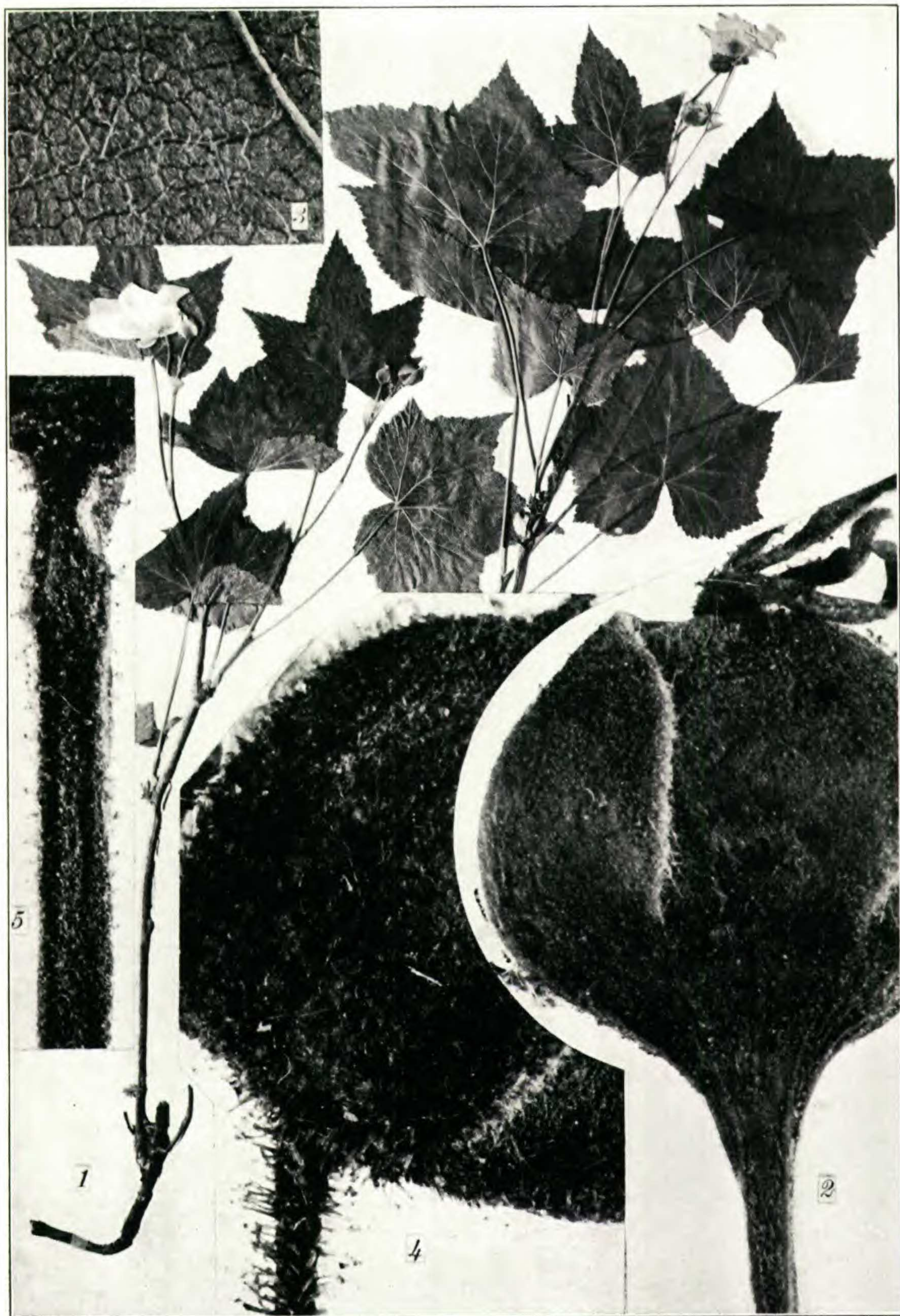


Photo. E. C. Ogden.

VARIETIES OF *RUBUS PARVIFLORUS*; habit, $\times \frac{2}{5}$, details, $\times 10$.

Var. *GRANDIFLORUS*: FIG. 4, pedicel and calyx, from South Dakota.

Var. *SCOPULORUM*: FIG. 5, pedicel, from Colorado.

Var. *PARVIFOLIUS*: FIG. 1, 2 plants; FIG. 2, calyx and pedicel; FIG. 3, lower surface of leaf; all from New Mexico.

Shrubs 1.5–6 dm. high; leaves 0.5–1.3 dm. broad, minutely and sparsely pubescent to glabrate beneath; inflorescences 1–2 (–4)-flowered, their lowest pedicels 2–6 cm. long.

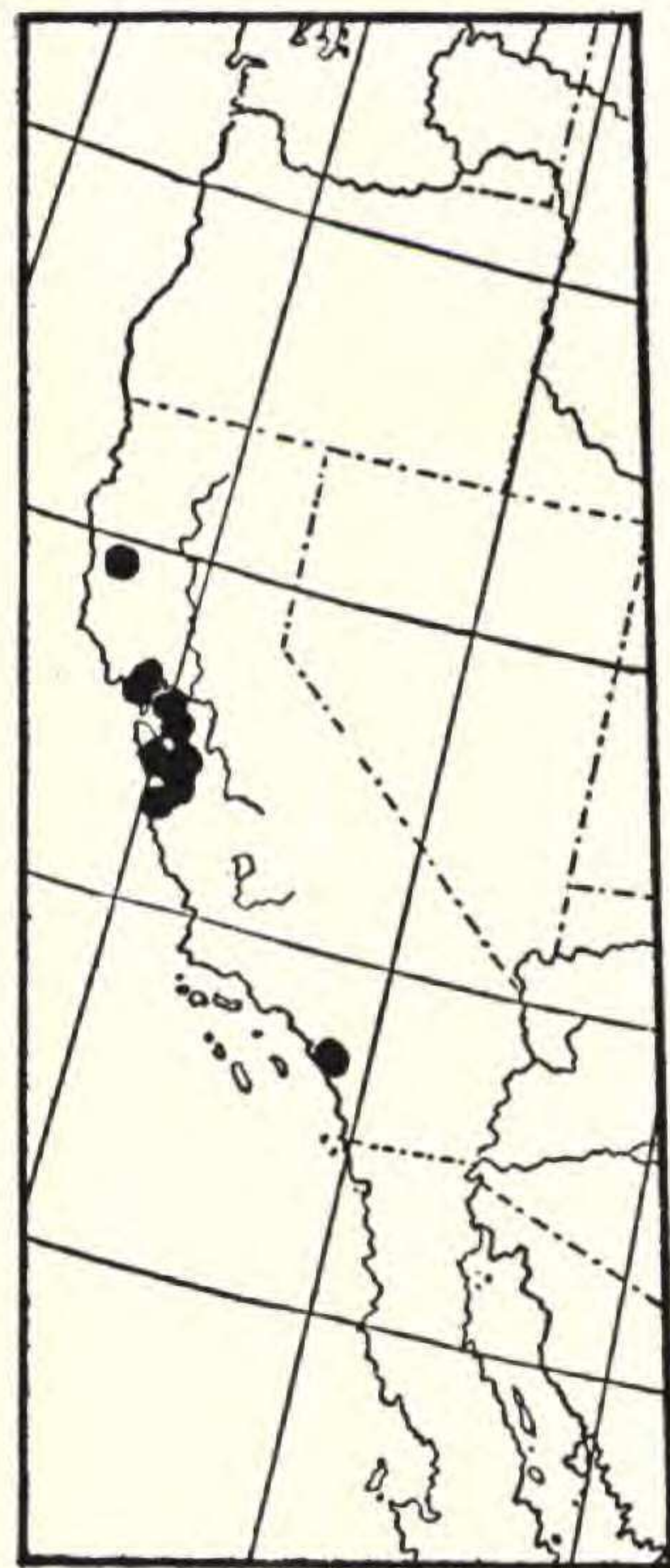
8. Var. *parvifolius*.

1. **RUBUS PARVIFLORUS** Nutt., var. **genuinus** (PLATE 364, FIGS. 1 and 2). *R. parviflorus* Nutt. Gen. i. 308 (1818). *R. nutkanus*, β , *Nuttallii* Torr. & Gr. Fl. N. Am. i. 450 (1840). *Rubacer parviflorum* (Nutt.) Rydb. Bull. Torr. Bot. Cl. xxx. 274 (1903), in small part, but as to type. *Bossekia parviflora* (Nutt.) Greene, Leaflets, i. 211 (1906), as to type. *R. nutkanus*, var. *parviflorus* (Nutt.) Focke, Bibl. Bot. xvii⁷². 124 (1911), as to type.—Localized about the Upper Great Lakes in northern Michigan, Wisconsin (and presumably Minnesota). The following have been studied. MICHIGAN: Mackinac Island, July, 1881, *T. E. Boyce*, no. 783 (TOPO-TYPE); upper reaches of Slate River and surrounding woods, Gogebic Co., August 25, 1919, *H. T. Darlington*, no. 3041 (Mich. State). WISCONSIN: Stony Creek, Algoma, Kewaunee Co., July 24, 1929, *J. J. Davis* (Wisc.); Sturgeon Bay, Door Co., July 26, 1929, *J. J. Davis* (Wisc.); Superior, Douglas Co., June 30, 1927, *L. R. Wilson & L. M. Jones*, no. 279 (Wisc.). MAP 15.



MAP 15. Range of **RUBUS PARVIFLORUS**, var. **GENUINUS**.

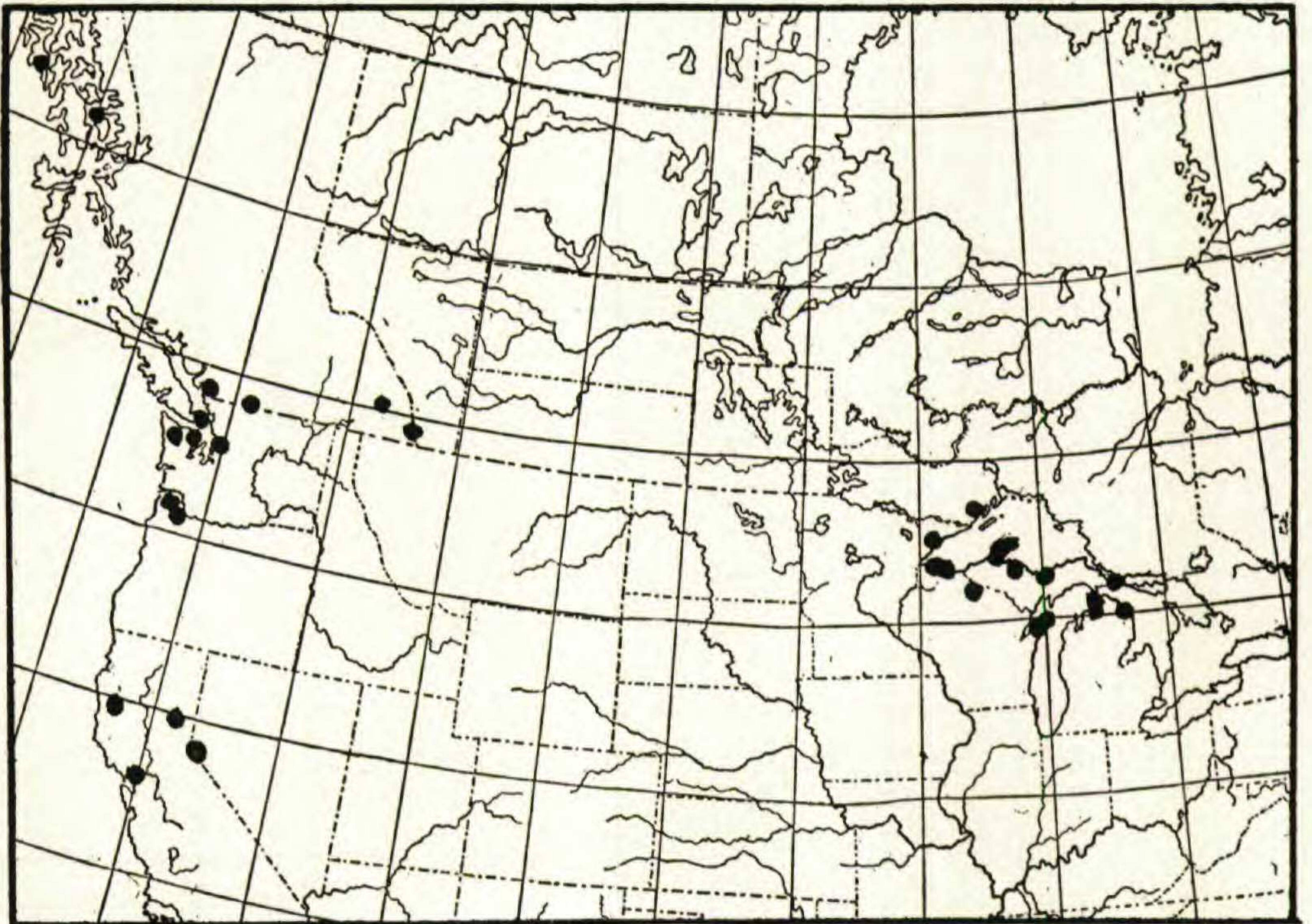
2. Var. **VELUTINUS** (Hook. & Arn.) Greene, Bull. Torr. Bot. Cl. xvii. 14 (1890) (PLATE 364, FIGS. 3 and 4). *R. velutinus* Hook. & Arn. Bot. Beech. Voy. 140 (1832), not Vest (1823). *R. nutkanus*, var. *velutinus* (Hook. & Arn.) Brewer, Bot. Calif. i. 172 (1876). *Rubacer tomentosum* Rydb. Bull. Torr. Bot. Cl. xxx. 274 (1903). *Rubacer velutinus* (Hook. & Arn.) Heller, Muhlenbergia, i. 106 (1904). *Rubus parviflorus*, var. *grandiflora* [us], subvar. *velutinus* (Hook. & Arn.) Farwell, Am. Midl. Nat. xi. 263 (1929).—Coastal region of California. MAP 16.



MAP 16. Range of **RUBUS PARVIFLORUS**, var. **VELUTINUS**.

3. Var. **hypomalacus**, var. nov. (TAB. 364, FIG. 5), foliis subtus subvelutinis; pedicellorum pedunculorumque glandulis stipitatis valde inaequalibus plerumque sordidis longioribus ad 1–2 mm. longis.—Southern Alaska to southern California, inland across southern British Columbia to the Canadian Rocky Mountains; about the Upper Great Lakes, northern Michigan, Wisconsin, Minnesota and adjacent Ontario. The following (selected from many specimens) are representative. MICHIGAN: limestone till, Bois Blanc Island, Mackinac Co., *Ehlers*, no. 4852;

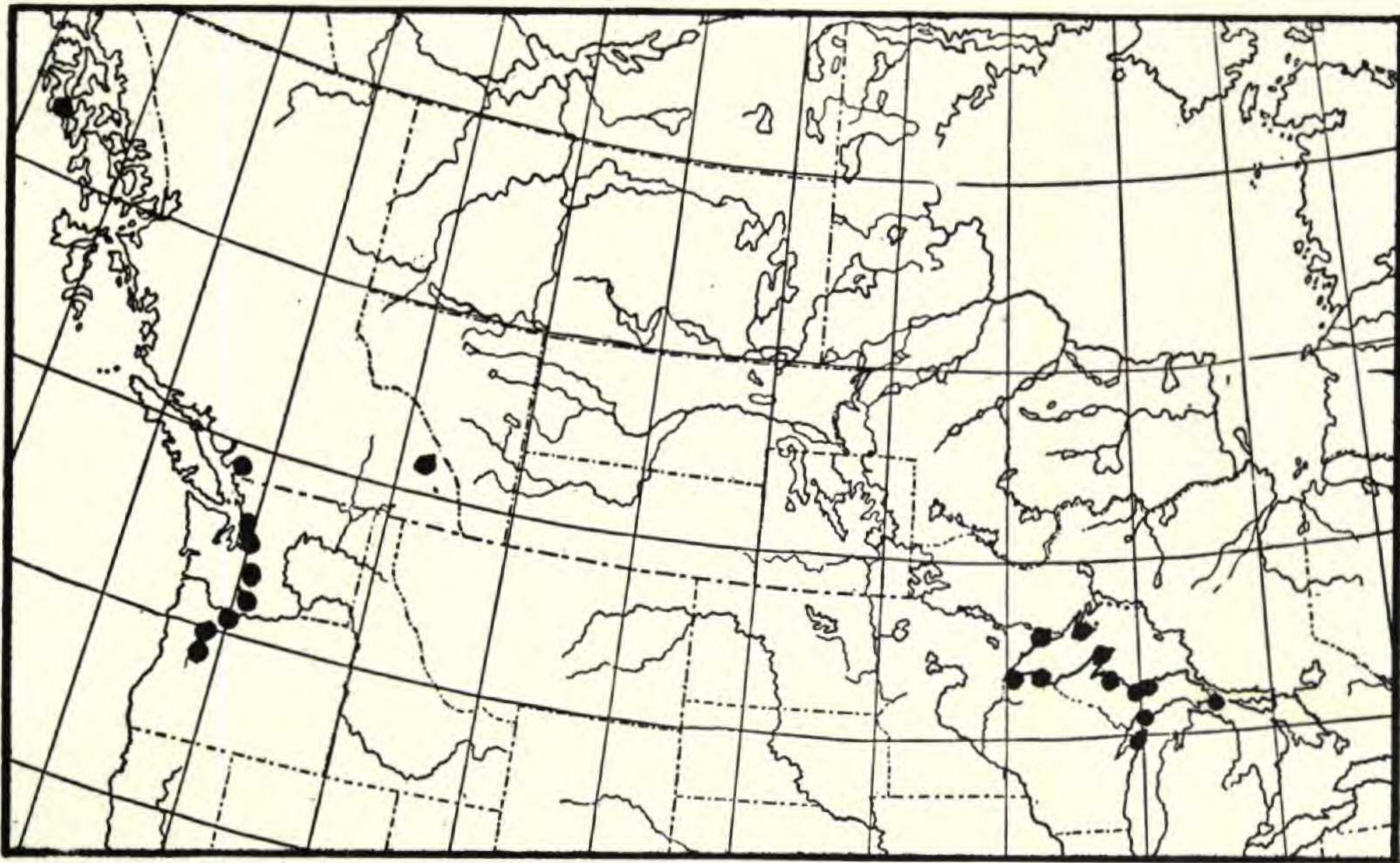
rich deciduous woods above Miner's Falls, near Munising, Alger Co., *Fernald & Pease*, no. 3388; along road to Mt. Mesnard, Marquette Co., August 3, 1906, *Dachnowski* (Mich.); edge of open woods, near Bear Lake, Houghton Co., *Hermann*, no. 389 (Mich.); "in peninsulâ Keweenaw, anno 1863," *J. W. Robbins*; Bête Grise, Keweenaw Co., *Hermann*, no. 337 (Mich.); north shore of Thunder Bay, Alpena Co., July 3, 1895, *C. F. Wheeler* (Mich. State); roadside between Cecil Bay and Big Stone Bay, Emmet Co., *C. O. Erlanson*, no. 303 (Mich.); coniferous woods near Cecil Bay, *Ehlers*, no. 2896 (Wisc.); mixed woods, Big Stone Bay, *Ehlers*, no. 503. WISCONSIN: Whitefish Bay, west shore of Lake Michigan, June 22, 1866, *Lewis Foote* (Mich.); woods and fields, Ephraim, Door Co., *Pease*, no. 18,040; Clark Lake, Door Co., August 1, 1929, *J. J. Davis* (Wisc.); bank near Sand Lake, Lac du Flambeau Reservation, Vilas Co., *Fassett*, no. 10,827 (Wisc.); Sand Island, Lake Superior, *L. S. Cheney*, no. 6184 (Wisc.); Washburn, Bayfield Co., June 27, 1910, *E. H. Toole* (Wisc.); woods near Port Wing, Bayfield Co., June 14, 1928, *Griscom*. MINNESOTA: Two Harbors, Lake Co., June, 1893, *E. P. Sheldon*. ALASKA: Stika, *Bongard*; clearing at beach, Tongas Village, *Walker*, no. 891. BRITISH COLUMBIA: damp thickets, Kootenai Pass, *Dawson*, no. 139; shore of Howser Lake, Selkirk Mts., *Shaw*, no. 708; Chilliwack Valley, *J. M. Macoun*, no. 34,808; Vancouver, June 25, 1903, *J. Fowler* (Wisc.). WASHINGTON: Friday Harbor, San Juan Islands, *Zeller*, no. 757; Port Ludlow, June 15, 1889, *F. Binns*; foothills, Olympic Mts., *J. M. Grant*, no. 211 (TYPE in Gray Herb.);



MAP 17. Range of *RUBUS PARVIFLORUS*, var. *HYPOMALACUS*.

fields, Marysville, May, 1924, *J. M. Grant*. OREGON: Ross Slough, Coos Co., *H. H. Smith*, no. 3678; hillsides, Portland, August 30, 1889, *Drake & Dickson*. CALIFORNIA: near John Day's, Mendocino Co., *Heller*, no. 5850; north slopes, Jonesville, Butte Co., *Copeland*, no. 419 (Wisc.); Berkeley, *W. W. Jones*, no. 161. NEVADA: King's Cañon, Ormsby Co., *C. F. Baker*, no. 1097. MAP 17.

In some of its specimens var. *hypomalacus* approaches the Californian var. *velutinus* but it differs in the shorter and more glandular pubescence of the calyx, in the less villous branchlets and, usually, in the sparser pubescence of the foliage. Doubtless var. *hypomalacus* has been the basis of some records of var. *velutinus* from north of California.

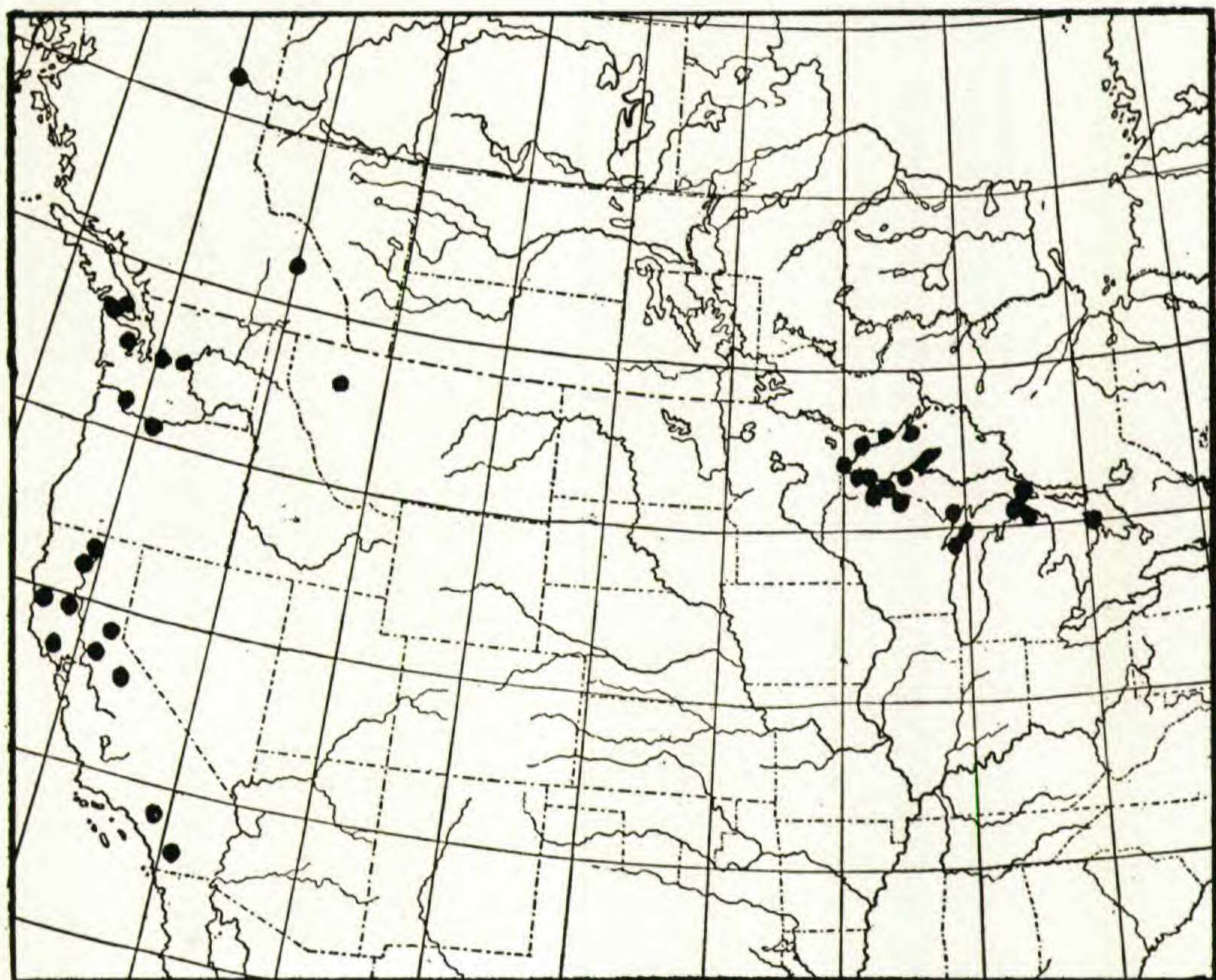


MAP 18. Range of RUBUS PARVIFLORUS, var. HETERADENIUS.

4. Var. **heteradenius**, var. nov. (TAB. 364, FIG. 6), foliis subtus (nerviis exceptis) glabris vel glabratis; pedicellorum pedunculorumque glandulis valde inaequalibus plerumque sordidis longioribus ad 1-2 mm. longis.—Southern Alaska to Oregon and the Selkirk Mts. of British Columbia; region of Upper Great Lakes, Michigan, Wisconsin and Minnesota. The following are characteristic. MICHIGAN: rocky woods, Bois Blanc Island, Mackinac Co., *Ehlers*, no. 4852 (Mich.); Negaunee, Marquette Co., July, 1871, *Mary H. Clark* (Mich.); "in peninsulâ Keweenaw, anno 1863," *J. W. Robbins*; Bête Grise, Keweenaw Co., *Hermann*, no. 337 (Mich.); border of open woods north of Garden, Delta Co., *Fernald & Pease*, no. 3389. WISCONSIN: Door Co., July 1, 1883, *Schuetz* (Wisc.); Madeline Island, Ashland Co., *Jackson & Sheldon*, no. 217 (Wisc.); Superior, August 23, 1893, *E. T. Harper* (Wisc.). MINNESOTA: woods and wooded hillsides, near

Hoveland, Cook Co., *Rosendahl & Butters*, no. 4627. ALASKA: Sitka, *Bischoff*. BRITISH COLUMBIA: Glacier, August 19, 1909, *Olson*; Vancouver, June 8, 1903, *J. Fowler* (Wisc.). WASHINGTON: fields, Marysville, May, 1922, *J. M. Grant* (Wisc.); grassy slopes, at 3000–4000 ft., Mt. Paddo, *Suksdorf*, no. 1758; on damp ground, Falcon Valley, June 26, 1893, *Suksdorf*, no. 1758 (TYPE in Gray Herb.). OREGON: Willamette Hills, May, 1892, *Mulford*; along stream, Salem, *J. C. Nelson*, no. 1280. MAP 18.

5. Var. **bifarius**, var. nov., foliis subtus subvelutinis; pedicellorum pedunculorumque glandulis stipitatis uniformibus plerumque pallidis vix 0.5 mm. longis.—British Columbia to southern California and northwestern Montana; region of Upper Great Lakes, Ontario, Michigan, Wisconsin and Minnesota. The following are characteristic. ONTARIO: Cameron Lake, Bruce Co., *Krotkov*, no. 7549. MICHIGAN: open rocky woods, Prentis Bay, Mackinac Co., *Ehlers*, no. 1343 (Mich.); Eureka, Houghton Co., *Hermann*, no. 389 (Mich.); roadside near Silver Isle, Keweenaw Co., *Hermann*, no. 2187 (Mich.); edge of spruce woods near Bête Grise, Keweenaw Co., *Hermann*, no. 337 (Mich.); Isle Royale, 1868, *A. E. Foote* (Mich.); Ontonagan, 1860, *Mary H. Clark* (Mich.); gravel ridges Koss, Menominee Co., July 12, 1905, *C. A. Davis* (Mich.); banks of Limestone Creek, south of Mackinaw City, Cheboygan Co., *Ehlers*, no. 5261; shaded rich ground, near



MAP 19. Range of RUBUS PARVIFLORUS, VAR. BIFARIUS.

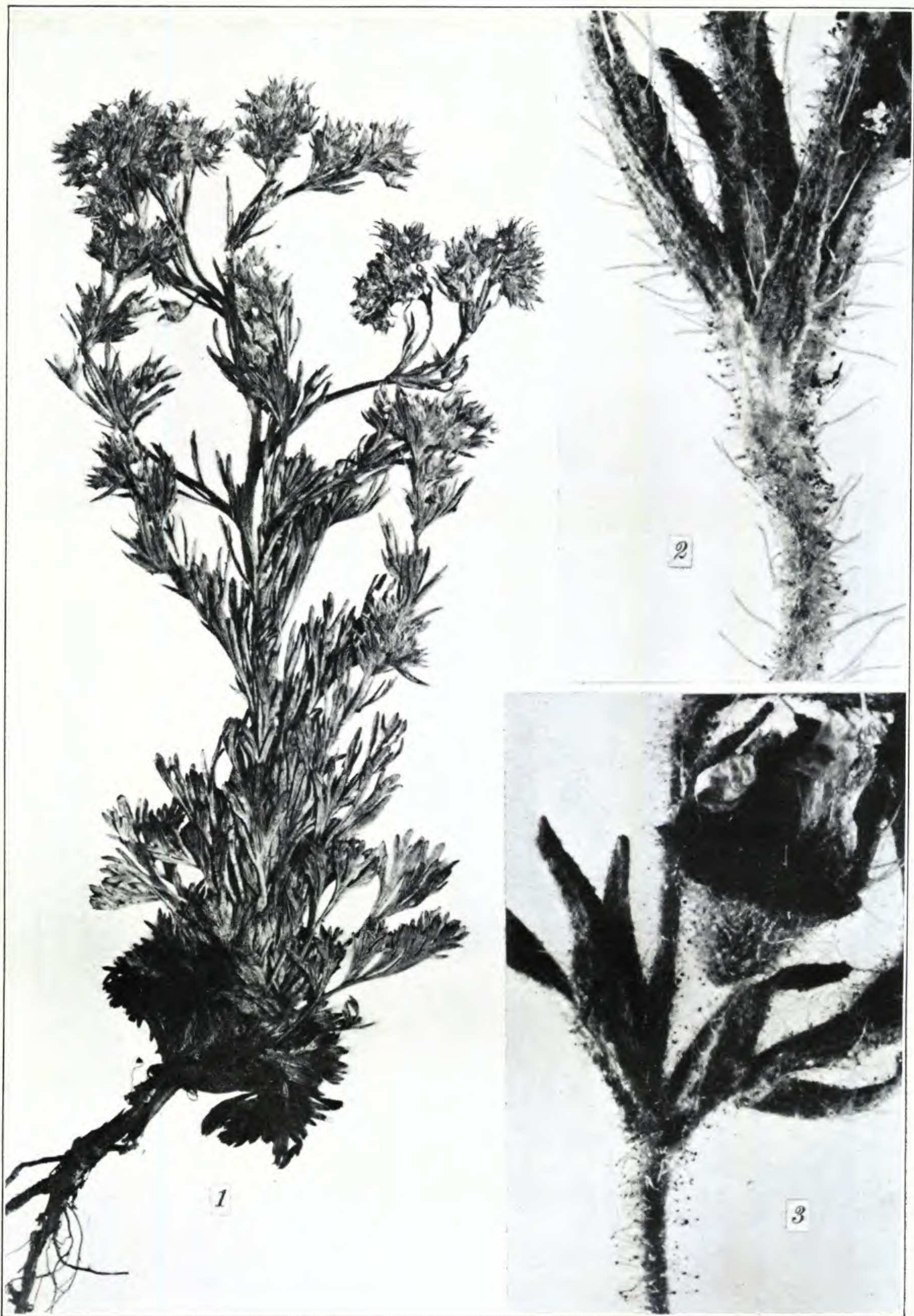


Photo. E. C. Ogden

CHAMAERHODOS NUTTALLII: FIG. 3, branch, $\times 10$, to show pubescence.
C. NUTTALLII, var. KEWEENAWENSIS: FIG. 1, plant, $\times 1$, from Keweenaw Peninsula;
FIG. 2, branch, $\times 10$, to show pubescence.



Photo. E. C. Ogden.

POTENTILLA FRUTICOSA, forma VILLOSISSIMA: FIG. 1, fruiting branch, $\times 1$; FIG. 2, leafy branch, $\times 1$; FIG. 3, branchlet, $\times 3$.

Grand Lake, Presque Isle Co., June 26, 1912, *C. K. Dodge* (Mich.). WISCONSIN: Washington Island, Door Co., July 3, 1931, *J. J. Davis* (Wisc.); rocky banks of Potato River, Gurney, Iron Co., *Newton Bobb*, no. 272 (Wisc.); Ashland, *Hermann*, no. 294 (Mich.); La Pointe, September, 1858, *Lapham* (Wisc.); mainland east of Sand Bay, Lake Superior, *L. S. Cheney*, no. 6275 (Wisc.); Wisconsin River, Newbold, *Cheney*, no. 1624 (Wisc.). MINNESOTA: opening in hardwoods, Grand Portage, Cook Co., *Butters & Buell*, no. 344; Two Harbors, Lake Co., *Sheldon*, nos. 4938, 5254 (Wisc.); Farquhar Point, Lake Superior, 1870, *J. C. Jones* (Mich.); near Duluth, July 5, 1893, *A. E. Gurd* (Mich.). MONTANA: woods, foot of Kootenai Mts., Big Fork, August 10, 1901, *Umbach*. BRITISH COLUMBIA: rich woods along Wicked River, near the Peace River, *Raup & Abbe*, no. 3800 (Arn. Arb.); banks near Cameron Lake, Vancouver Island, July 14, 1917, *W. R. Carter* (TYPE in Gray Herb.); thickets, District of Renfrew, *Rosendahl & Brand*, no. 3. WASHINGTON: Brinnon, Jefferson Co., *Beattie*, no. 3068 (Wisc.); Snoqualmie, August 8, 1924, *E. J. Kraus* (Wisc.); Kelso, August 8, 1924, *Kraus* (Wisc.); Peshastin, Okanagan Co., *Sandberg & Leiberg*, no. 542. OREGON: open woods, lower Hood River, 1924, *Henderson*, no. 892. CALIFORNIA: near John Day's, Mendocino Co., *Heller*, no. 5850; Goose Valley, Shasta Co., *Eastwood*, no. 883; between Upper Soda Spring and Shasta Retreat, Siskiyou Co., *Heller*, no. 7949; Yosemite Valley, alt. 4000–4500 feet, *Abrams*, no. 4367; wooded north slope, west of Bennett, Glenn Co., *Heller*, no. 11,979; ravine near Fallen Leaf Lake, Tahoe, *Smiley*, no. 361; Big Trees, Calaveras Co., *H. Mann*; vicinity of San Bernardino, alt. 6500 feet, *W. G. Wright*, no. 250; in shade near brook, Idyllwild, San Jacinto Mts., alt. 5300 feet, *M. F. Spencer*, no. 1731. MAP 19.

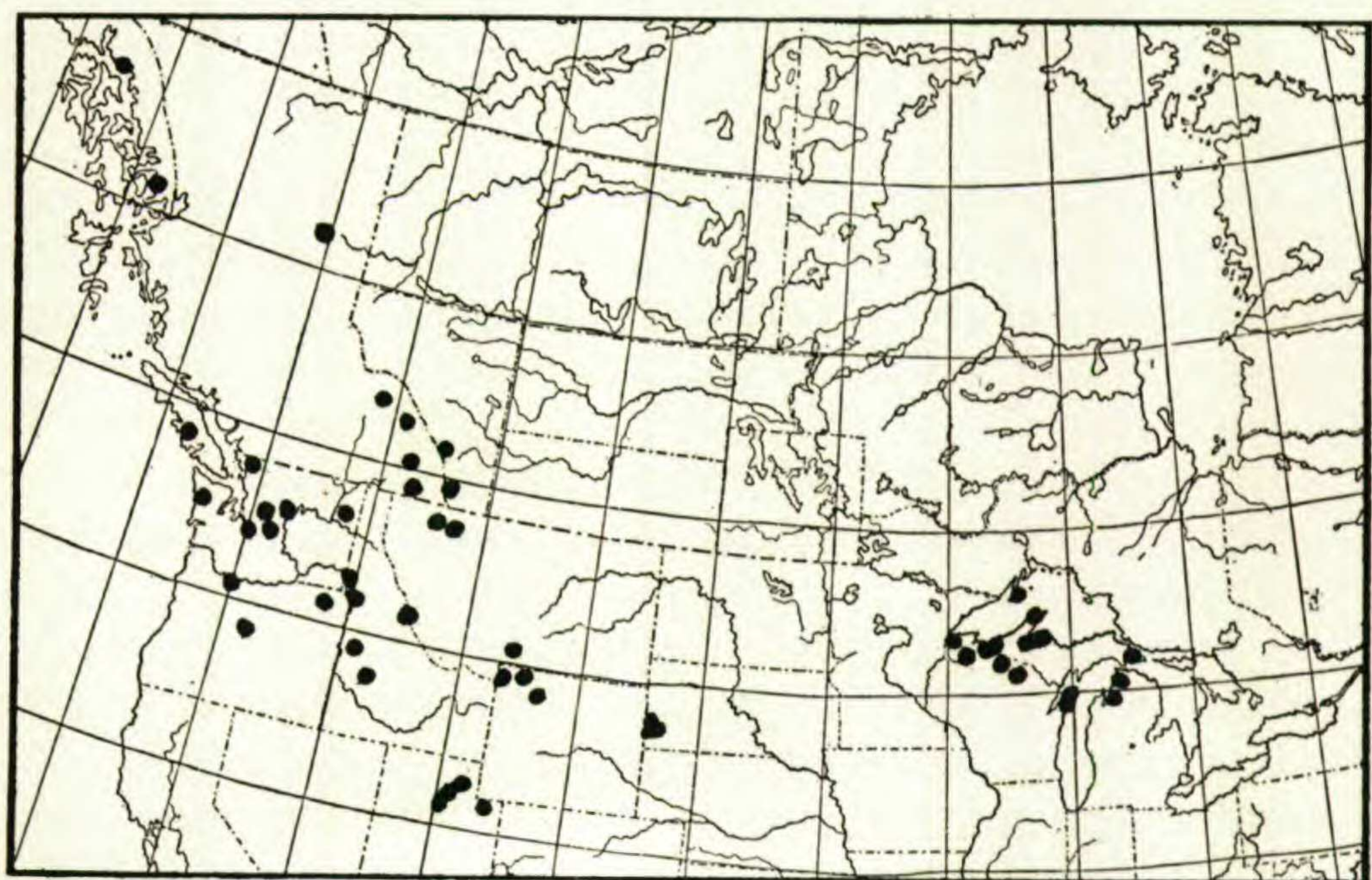
Var. BIFARIUS, forma **lacera** (Kuntze), comb. nov. *R. nutkanus*, f. *lacera* Kuntze, Meth. Sp. 102 (1879).—Vancouver Island, 1858, *Lyall*.

A sheet of the type-collection (in flower) in the Gray Herbarium is clearly a cut-leaved form of var. *bifarius*. Its leaves are cleft only 2/3–3/4 to the base. *R. PARVIFLORUS*, forma PEDATIFIDUS Hermann, RHODORA, xxxvii. 61, t. 326, fig. 2, has the leaves cleft to the base. It also is a form of var. *bifarius*.

Another form of *R. parviflorus*, presumably belonging to var. *bifarius*, is f. **Fraserianus** (J. K. Henry), comb. nov. *R. parviflorus*, var. *Fraserianus* J. K. Henry, Torreya, xviii. 54, fig. 1 (1918), a plant with leaves "rather densely pilose beneath" and differing from the ordinary forms in having the summits of the petals laciniate-dentate. It is described as "not common" at Ucleulet, Vancouver Island. It must be considered an aberrant form, not a true geographic variety.

6. Var. GRANDIFLORUS (as "GRANDIFLORA") Farwell, Am. Midl. Nat. xi. 263 (1929). (PLATE 365, FIG. 4.) *R. nutkanus* Moçino ex

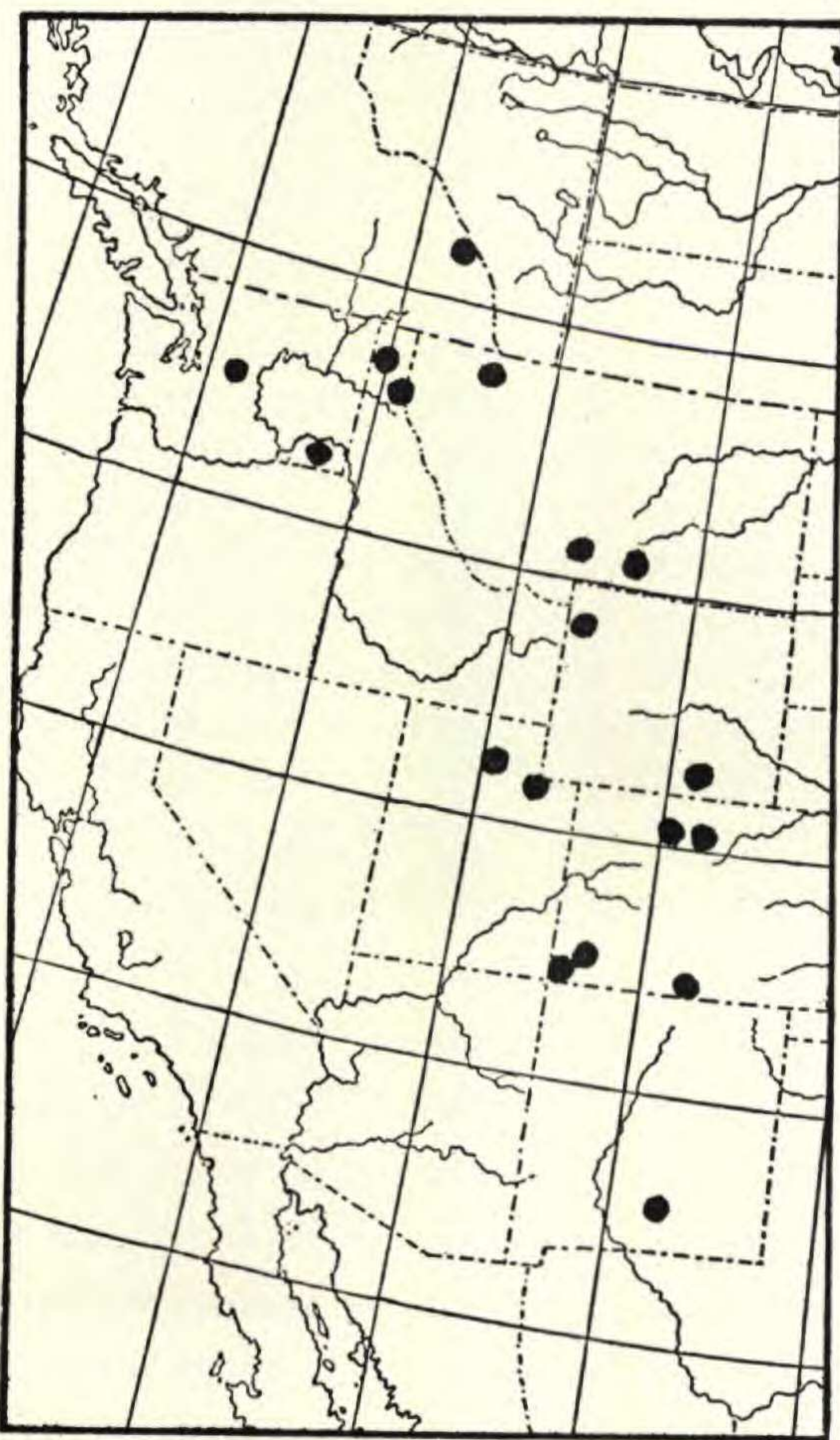
Seringe in DC. Prodr. ii. 566 (1825), inadequately characterized.— Southern Alaska to Oregon, Idaho, Utah and Wyoming; Black Hills, South Dakota; region of Upper Great Lakes, Michigan and Wisconsin (doubtless also Minnesota). The following are characteristic. MICHIGAN: open woods, Prentis Bay, Mackinac Co., *Ehlers*, no. 1349 (Mich.); Marquette, *Pepoon*, no. 1563 (Mich.); shaded ground, Sugar Loaf Mt., Marquette Co., July 3, 1916, *C. K. Dodge* (Mich.); L'Anse, Baraga Co., August 29, 1893, *S. R. Bailey* (Mich.); Elk Rapids, June 30, 1902, *Cooper* (Mich. State); Keweenaw Peninsula, 1863, *Robbins*; Isle Royale, *Stuntz & Allen*, no. 102; open woods, Rock Harbor, Isle Royale, *McFarlin*, no. 2004. WISCONSIN: sandy woods, Washington Island, Door Co., *A. M. Fuller*, no. 1395 (Wisc.); Door Co., July, 1883, *Schuette*; lower 2 miles of Montreal River, *L. S. Cheney*, no. 5090 (Wisc.); Vilas Co., July 1, 1923, *S. I. Lilygren* (Wisc.); Mt. Whittlesey, Mellen, Ashland Co., *L. R. Wilson*, no. 10,135 (Wisc.); Grandfather Bull Falls, Lincoln Co., *Cheney*, no. 2471 (Wisc.); Drummond, *Cheney*, no. 4144 (Wisc.); Superior, Douglas Co., *Chas. Goessl*, no. 7843 (Wisc.) SOUTH DAKOTA: near Lead City, alt. 5500–6500 feet, *Rydberg*, no. 655; head of City Creek, alt. 5300 feet, *J. Murdoch, jr.*, no. 3541; damp ravines, Pluma, *W. P. Carr*, no. 175. MONTANA: Decent to Ross' Hole, *S. Watson*, no. 103; woods, Midvale, *Umbach*, no. 412 (Wisc.); Lake McDonald, *Vreeland*, no. 933; Emigrant Gulch, *Rydberg & Bessey*, no. 4327. IDAHO: copses above Lewiston, *Sandberg, MacDougal & Heller*, no. 300; Lake Waha, Nez Perces Co., June 22, 1896, *Heller* (Wisc.); timbered hillside, Tamarack, Washington Co., *J. A. Clark*, no. 225; creek-bank, Boise, *J. A. Clark*, no. 98. WYOMING: Crandall Creek, Clark's Fork Mts., August, 1881,



MAP 20. Range of RUBUS PARVIFLORUS, var. GRANDIFLORUS.

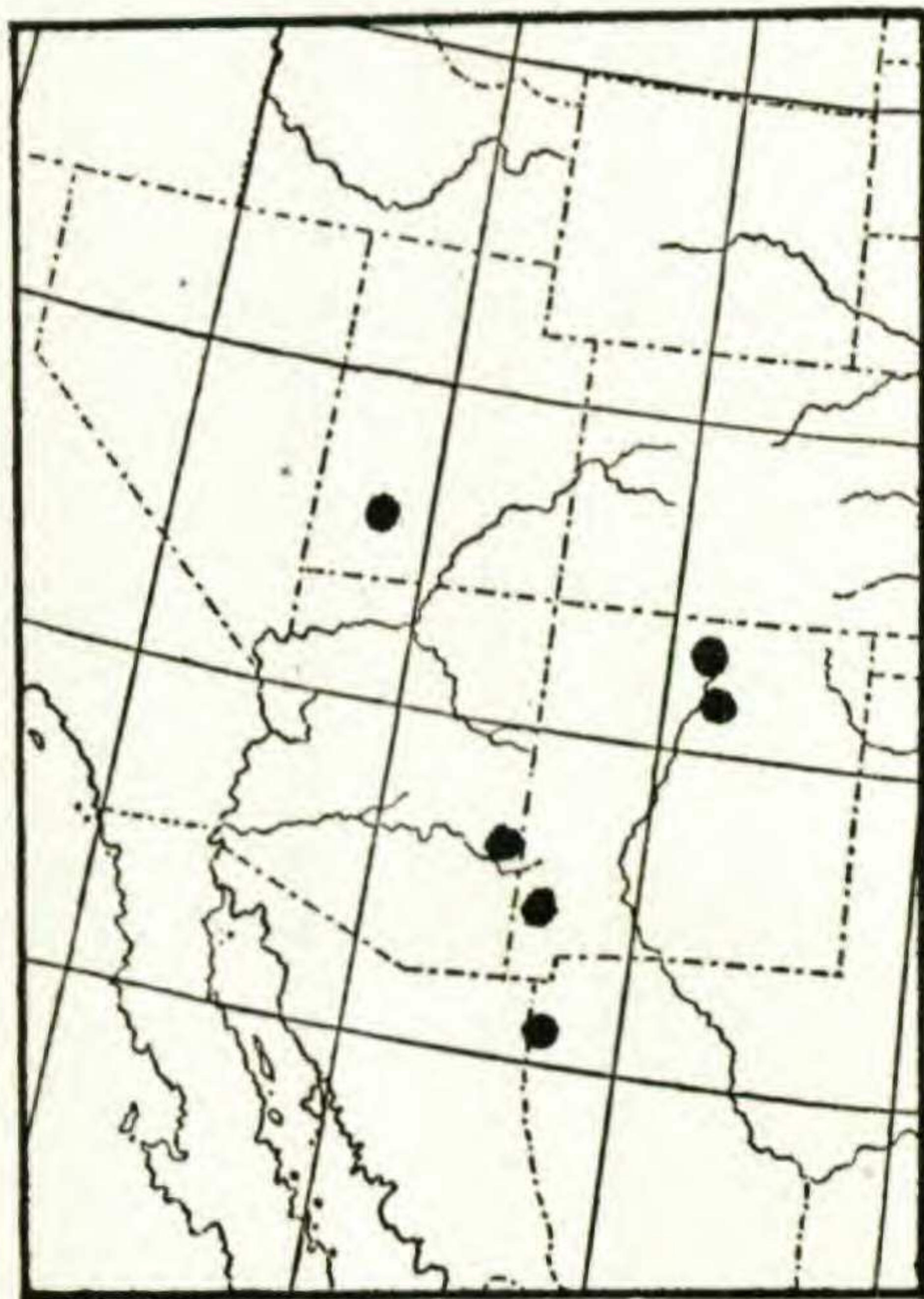
Forwood; wooded cañon, Yancey's, *Nelson & Nelson*, no. 5924. COLORADO: rocky slopes, Rabbit Ear Range, Routt Co., *Goodding*, no. 1596. UTAH: timbered gulch, Dyer Mine, Uintah Mts., *Goodding*, no. 1424; Red Butte Cañon, July 11, 1908, *Mrs. Joseph Clemens*; Wasatch Mts., at 7000 feet, *S. Watson*, no. 308; shady subalpine banks, alt. 8000–10,000 feet, Peterson Cañon, *Pammel & Blackwood*, no. 3803. ALASKA: Wrangell, *Walker*, no. 677; Juneau, June 25, 1899, *L. J. Cole* (Wisc.). BRITISH COLUMBIA: poplar-spruce forest, near head of Rocky Mountain Cañon, Peace River, *Raup & Abbe*, no. 3742 (Arn. Arb.); woods, Emerald Lake, Selkirk Mts., *Shaw*, no. 129; Carbonate, Selkirk Mts., *Shaw*, no. 188; thickets, Donald, July 3, 1885, *J. M. Macoun*. WASHINGTON: Clark Springs, Spokane Co., *Kraeger*, no. 37; mountains above Chelan, *Lake & Hull*, no. 502 (Wisc.) upper valley of the Nesqually, *O. D. Allen*, no. 25; valley of Swauk River, Kittitas Co., *S. P. Sharples*, no. 121; lake-shore, Quiniault, *Conard*, no. 103; Snoqualmie, August 12, 1924, *E. J. Kraus* (Wisc.); Bagley Lake, Whatcom Co., *J. W. Thompson*, no. 5358. OREGON: Mt. Emily, La Grande, Union Co., *H. P. Hansen*, no. 1078 (Wisc.); Crook Co., July 17, 1922, *Whited*; Bridal Veil, Multnomah Co., *H. H. Smith*, no. 3085. MAP 20.

7. Var. **scopulorum** (Greene), comb. nov. (PLATE 365, FIG. 5). *R. nutkanus*, var. *scopulorum* Greene ex Focke, *Bibl. Bot.* xvii⁷². 124 (1911).—Southeastern British Columbia and central Washington to New Mexico. The following are characteristic. BRITISH COLUMBIA: Kicking Horse Valley, *S. Brown*, no. 481. WASHINGTON: Blue Mts., Columbia Co., *Horner*, no. B164; Snoqualmie, August 12, 1924, *E. J. Kraus* (Wisc.). IDAHO: valley of North Fork of Coeur d'Alene River, *Leiberg*, no. 1525; woods, Sand Point, *Umbach*, no. 424 (Wisc.). MONTANA: coniferous woods, Lake Josephine Trail, Glacier Nat. Park, *McLaughlin*, no. 718 (Wisc.); West Rosebud River, alt. 7000 feet, July 11, 1923, *P. H. Hawkins* (Wisc.); Spanish Creek, Gallatin Co., July 15, 1901, *Vogel*. WYOMING: Jennings Lake, Jackson Hole, *Merrill & Wilcox*, no. 916; Centennial Valley, *Nelson*, no. 1676.



MAP 21. Range of *RUBUS PARVIFLORUS*, var. *SCOPULORUM*.

UTAH: Big Cottonwood Cañon, Salt Lake Co., *O. A. Garrett*, no. 1685; wooded slope near Stillwater Fork, Uintah Mts., *Payson & Payson*, no. 5147. COLORADO: forest, gulch west of Bear River, alt. 7000 feet, *Crandall*, no. 195; headwaters of Clear Creek, *Parry*, no. 211; mountains about Steamboat Springs, Routt Co., July 15, 1902, *G. E. Osterhout* (Wisc.); bottom of La Plata Cañon, *Baker, Earle & Tracy*, no. 680. NEW MEXICO: Sierra Blanca Peak, Otero Co., *C. B. Wolf*, no. 2858. MAP 21.

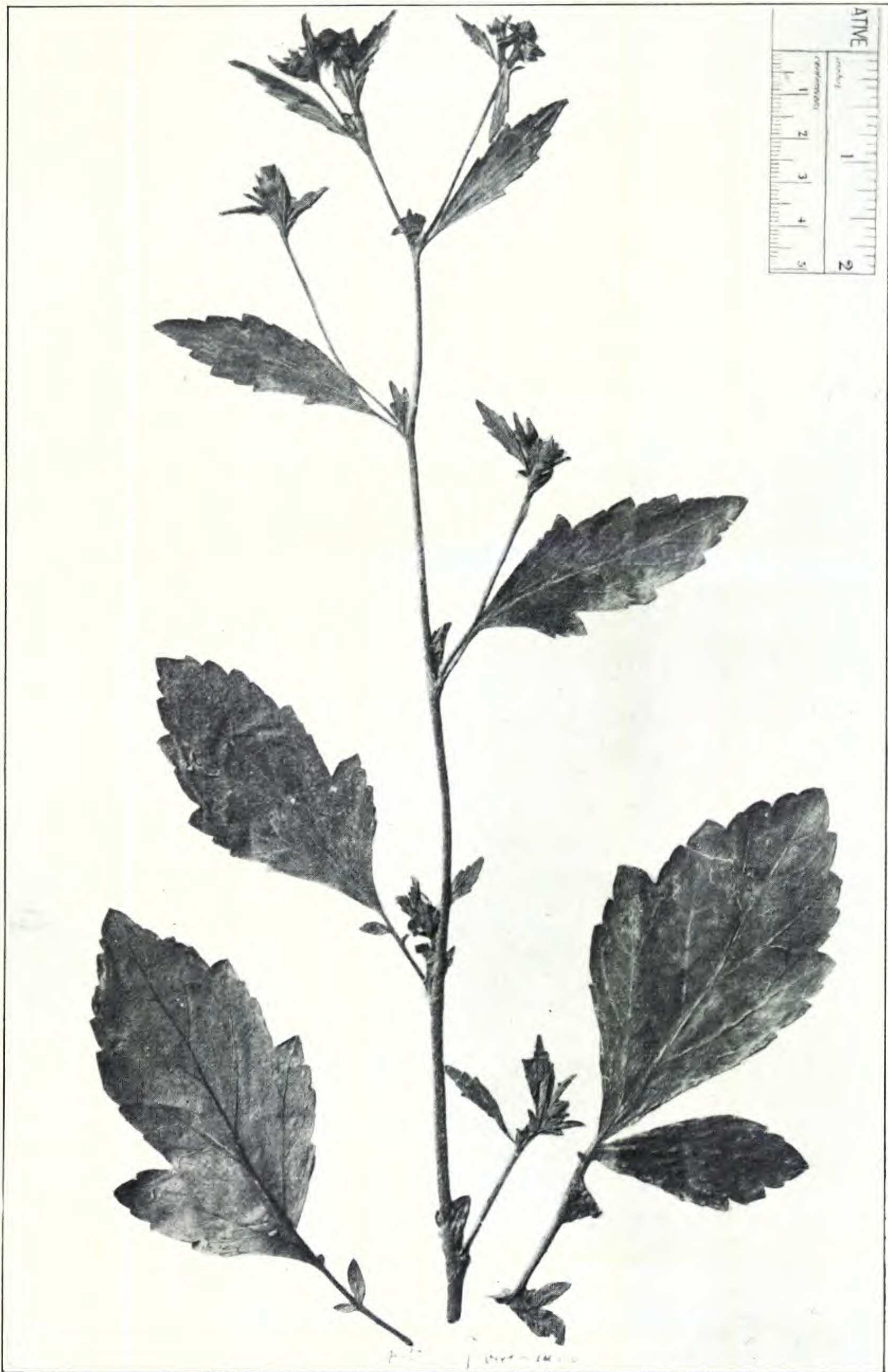


MAP 22. Range of *RUBUS PARVIFLORUS*, var. *PARVIFOLIUS*.

8. Var. **parvifolius** (Gray), comb. nov. (PLATE 365, FIGS. 1-3). *R. nutkanas*, var. *parvifolius* Gray, Pl. Fendl., Mem. Amer. Acad. ser. 2, iv. 42 (1849).—Utah and New Mexico to northern Chihuahua. UTAH: City Creek Canon, June 4, 1883, *F. E. Leonard*. NEW MEXICO: shady banks of Santa Fé Creek, June, July, 1847, *Fendler*, no. 208 (TYPE); Winsor's Ranch, alt. 8400 feet, Pecos River National Forest, *Standley*, no. 4032; 10 miles east of Mogollon, at 8700 feet, Mogollon Mts., Catron Co., *C. B. Wolf*, no. 2711; Mogollon Creek, at 7500 feet, Socorro Co., *Metcalf*, no. 281. ARIZONA: in timber, Thompson Ranch, Black River, *Goodding*, no. 576. MEXICO: mountains 15-20 miles south of Pacheco, Chihuahua, *C. V. Hartman*, no. 696. MAP 22.

CHAMAERHODOS NUTTALLII Pickering, var. **keweenawensis**, var. nov. (TAB. 366, FIGS. 1 et 2), caulibus ramisque valde hispidis, pilis ad 1.5 mm. longis.—Keweenaw County, MICHIGAN: wind-swept crests, crevices and talus of sandstone-conglomerate, West Bluff, July 4, 1934, *Fernald & Pease*, no. 3376 (TYPE in Gray Herb.). See p. 213 and MAP 10.

Chamaerhodos Nuttallii Pickering in Torr. & Gray, Fl. N. Am. i. 433 (1840), as synonym of *C. erecta* β . *Nuttallii* T. & G., l. c. (1840), Rydberg, N. Am. Fl. xxii. 377 (1908), validating the name, was based on *Sibbaldia erecta* β . *parviflora* Nutt. Gen. N. Am. Pl. i. 207 (1818), from "the highest gravelly hills, 10 to 15 miles from the Mandan villages." *C. Nuttallii*, found on arid plains and crests from Yukon to Colorado, east to Manitoba and western Minnesota, has the stem and branches densely glandular and at most minutely pilose. Its pubescence is well displayed in FIG. 3, made from plants collected in the type region, dry hilltop, Mandan, North Dakota, June 23, 1912



TYPE OF GEUM VIRGINIANUM

(Specimen in Linnean Herbarium; photograph from Mr. S. Savage).



GEUM ALEPPICUM
(after Jacquin).

by *O. A. Stevens*. The plant of the Keweenaw region, isolated by 375 miles from typical *C. Nuttallii*, is consistently hispid (as well as glandular) as shown in FIG. 2.

WALDSTEINIA FRAGARIOIDES (Michx.) Tratt., var. **parviflora** (Small), comb. nov. *W. parviflora*, Small, Bull. Torr. Bot. Cl. xxv. 137 (1898).

Waldsteinia fragarioides, like *Fragaria virginiana*, has petals highly variable in size as well as outline. When Small published *W. parviflora* as a new southern species he stated that "The new species may be distinguished from *W. fragarioides* by the more prominent disc, the small sessile petals which are about as long as the calyx-segments or shorter, and the larger obovoid achene." Later Rydberg, in N. Am. Fl. xxii⁵. 398 (1913), reduced *W. parviflora* to *W. Doniana* Tratt., the latter based on the description and plate of a plant introduced into English gardens by George Don and illustrated as *Dalibarda fragarioides* in Bot. Mag. xxxviii. t. 1567 (1813); and in his Manual Small accepts this reduction, stating his conception of the differences between *W. fragarioides* and *W. Doniana* as follows:

- Petals twice as long as the sepals or longer; sepals mostly longer than the hypanthium 1. *W. fragarioides*.
- Petals as long as the sepals or shorter; sepals mostly shorter than the hypanthium 2. *W. Doniana*.

There is no evident or stated difference in the foliage and both plants show the same range of pubescence. If the distinction in the calyx given in Small's key is compared with the original plate of *W. Doniana* an unfortunate contradiction will be noted: the original plate of *W. Doniana* shows the hypanthia 3–4 mm. long, the lanceolate sepals 6.5–10 mm. long. In fact, *W. Doniana* is one of the extremes of *W. fragarioides* with longest rather than shortest sepals. In having the petals shorter than the exaggeratedly long sepals it differs from the more general run of *W. fragarioides* in the North, but its petals, correctly described "oblong-ovate," are shown in the plate up to 7 mm. long and 3.5 mm. broad, a measurement near the average for the northern plant. *W. parviflora*, under the misleading alias, *W. Doniana*, is defined as having "sepals triangular-lanceolate, . . . 2.5–3 mm. long" (*Rydberg*), "petals 2–4 mm. long" (*Small*).

I am, therefore, unable to see that *Waldsteinia Doniana* is quite identical with *W. parviflora*. It seems to me a garden-development in which, presumably through unwonted nutrition, the sepals became exaggeratedly large, the petals remaining fairly typical for *W. fragari-*

oides. In the northern half of the range of *W. fragarioides* (New England to Ontario and Wisconsin) I get the following measurements

LOCALITY	LENGTH OF HYPANTHIUM	LENGTH OF SEPAL	LENGTH OF PETAL	BREADTH OF PETAL
1. Monmouth, Maine	3 mm.	5 mm.	8 mm.	3.2 mm.
2. Benton, Maine	2.5	3.5	6	4
3. Hanover, New Hampshire	2	4.5	6	3.7
4. Lebanon, New Hampshire	2	4.5	7	3.5
5. St. Johnsbury, Vermont	2	2.5	5	2.5
6. Brandon, Vermont	2.5	5.5	9.5	5
7. Charlotte, Vermont	3	5.5	6	4.5
8. Middlebury, Vermont	2	4.5	7	4.5
9. Fair Haven, Vermont	3.5	5	6	3
10. Sudbury, Vermont	2	2.3-3	3.5	3
11. Poultney, Vermont	2	2.7	4.5	3
12. Brandon, Vermont	3.5	5.5	10	5
13. Coleraine, Massachusetts	3	3.5	8.5	6
14. Greenfield, Massachusetts	2.3	4	7	3.2
15. Greenfield, Massachusetts	4	6.5	10	5
16. Pittsfield, Massachusetts	2	4	7.5	4
17. Elmira, New York	2.5	5	5.5	3
18. Canadice, New York	2.5	5.5	8	3
19. Bainbridge, New York	3	4	6	5
20. Vaughns, New York	3	7.5	10	5.5
21. Newcomb, New York	2	3.8	4	2.8
22. Wingham, Ontario	3	2.7	6	2
23. Britannia, Ontario	2.5	4	6	3
24. Kingston, Ontario	3	5	6	3.5
25. Depere, Wisconsin	2.5	3.5	5	3.3
26. Lake Owen, Wisconsin	2	4	5.5	3

In the southern half of the range, down the Alleghanies, the measurements are similarly variable; but in the mountains from Virginia to Tennessee and Georgia there occurs an extreme plant with tiny petals, *Walsteinia parviflora* Small. There are only three sheets of it in the Gray Herbarium, but the measurements, while in most points overlapping those of the more northern *W. fragarioides*, indicate a fairly marked geographic variety, with very narrow and short petals:

LOCALITY	LENGTH OF HYPANTHIUM	LENGTH OF SEPAL	LENGTH OF PETAL	BREADTH OF PETAL
Mts. North Carolina	2.5-3.5	3-4	3.5-4	1.5
Harriman, Tennessee	2-2.5	3-3.5	3.5	1.5
Northern Georgia	2.5	3-4.5	2.5	1

POTENTILLA PENNSYLVANICA L. ONTARIO: sandy plain, Espanola, Sudbury Distr., no. 3378; sandy ground, site of Hudson Bay Co. post, Agawa Bay, Algoma Distr., Pease, no. 17,965. MICHIGAN: Isle Royale, July 21, 1909, Cooper; wind-swept crests, crevices and talus of sandstone-conglomerate, West Bluff, no. 3379.

This is the plant treated by Rydberg as *Potentilla pensylvanica* L. Rydberg, in 1898, gave the range: "a comparatively rare plant,

ranging in British America from Hudson Bay to the Rockies, and in these extends southward to Colorado”;¹ in 1908 he gave a similar range for his *P. pensylvanica*: “On the plains from Hudson Bay to the Yukon Territory and Colorado.”² This species has the radical leaves definitely “pinnate with 7–15 leaflets, . . . leaflets gradually reduced downward, . . . divided . . . into oblong divisions” (*Rydberg*) and its easternmost known stations are on the west side of Hudson Bay and near the shores of Lakes Superior and Huron.

There has been much uncertainty regarding the exact typification of *Potentilla pensylvanica*. The Linnean account was as follows:

pensylvanica 28. POTENTILLA foliis inferioribus pinnatis, superioribus ternatis: foliolis inciso-serratis, caule erecto pubescente.

Pentaphylloides canadense, foliis agrimoniae. *Boerh. lugdb. I. p. 40.*

Habitat in Canada. 24.

Folia Radicalia pinnata: foliolis oblongis, obtusiusculis, serrato-dentatis, lineatis, mollibus, villosis: extimis tribus coadunatis maioribus; int[er]ioribus minoribus alternis. Caulina subdigitata, septena, ut *P. recta*, sed pinnatifida. Petala vix calyce maiora. Habitus *P. rectae*. H. U. [Hortus Upsaliensis].³

From the habitat “Canada” and from the citation of Boerhaave’s plant, which he had received through Sarrasin, who was physician of the Court of Quebec, it is natural to infer that the name *P. pensylvanica* belongs to the plant of coastal rocks and gravels which abounds on the lower St. Lawrence, thence northeastward through the Straits of Belle Isle and southward to the coast of New Hampshire. In 1896, Rydberg described the latter as *P. litoralis* Bull. Torr. Bot. Cl. xxiii. 264 (1896), characterized by “Leaves pinnate, of two approximate pairs of leaflets, the lower the smaller, or subdigitately 5-foliolate.” Slightly thereafter, in his *Monograph* (1898) Rydberg maintained the plant of the eastern coast as *P. litoralis*, the plant of the Great Plains as *P. pensylvanica*; but he threw doubt into the situation by saying in his discussion of the western “*P. pensylvanica*”: “There is some doubt as to whether this is the true *P. Pennsylvanica* L. The description of the leaves of that species seems to indicate rather *P. litoralis*” (p. 96). Under the treatment of the latter he correctly summarized the difference in the range of the two: “*P. litoralis* is principally a beach plant, or at least growing near the coast, while *P. Pennsylvanica*

¹ Rydb. Mon. N. A. Potent., Mem. Dept. Bot. Columb. Univ. ii. 97 (1898).

² Rydb. N. Am. Fl. xxii. 350 (1908).

³ L. Mant. 76 (1767).

is an inland, plain or mountain species." *P. litoralis* was well illustrated in Rydb. Mem. Dept. Bot. Columbia Univ. ii. t. 37, figs. 1-5.

Subsequently (1908), without repeating the doubt he had expressed in 1898, Rydberg maintained the inland species with elongate, pinnate leaves of 7-11 leaflets as *P. pensylvanica*, the eastern coastal plant as *P. pectinata* Raf. Aut. Bot. 164 (1840). Rafinesque's account was unusually good:

1204, *Pot. pectinata* Raf. Pensylv. L. Tor[rey]. rare sp. of Canada and Boreal America, not of Pennsylvania: leaves hardly pinnatifid, rather digitate, 3-7folioles cuneate narrow pectinate, stipules lanceol. 2-3parted, stem bifurcate, calix linear lanceol. hirsute.

Potentilla pectinata Raf. (1840) and *P. litoralis* Rydb. (1896) are, then, synonyms, both belonging to the eastern coastal species. In view, however, of the facts, that Canada of Linnean time was primarily Quebec, that the Sarrasin specimen, which Boerhaave had, presumably came from the shores of the lower St. Lawrence, and that Rydberg had, himself, doubted in 1898 whether the eastern, rather than the western plant should stand as *P. pensylvanica*, it has seemed wise to settle the question. Through the always accommodating Assistant Secretary of the Linnean Society of London, Mr. S. Savage, I have a photograph of the Linnean type. Mr. Savage's letter accompanying it states that

I now send you a photograph of the type specimen of *Potentilla pensylvanica* Herb. Linn. The inscriptions on this sheet are as follows:

Ard [= Arduino], in Linnaeus's hand.

pensylvanica, in Linnaeus's hand.

Label in bottom right hand corner,—13 in Arduino's hand, and *pensylvanica* in Linnaeus's hand.

The specimen which Linnaeus had before him and described in detail, even to the 7 lobes of the upper leaflets of the cauline leaves, is clearly the type; it is the specimen of which Torrey wrote in 1824: "Sir J. E. Smith informs me, that *P. pennsylvanica* of the Linnean Herbarium resembles *P. recta* in shape of leaflets and serratures, but is pinnate and very soft-downy."¹

That it is a phase of the inland plant there can be no question; and that the name *pensylvanica* is quite as inappropriate for it as it would be for the Canadian and New England *P. pectinata* is equally obvious. In explanation of the misleading specific name published by Linnaeus a second letter from Mr. Savage is illuminating. Following up the source of *P. pensylvanica*, he finds that Linnaeus received it from

¹ Torr. Fl. N. Mid. U. S. 499 (1824).

Arduino some time subsequent to the publication of *Species Plantarum* ed. 2 (1762-63), and that the manuscript list of the specimens received at that time has in Linnaeus's hand the entry:

13. PENTAPHYLLOID. CANADENSE. *Potentilla canadensis* non habeo in speciebus accepi nuper ab aliis pulcherrimum specimen.

Since Linnaeus had already published the quite different *Potentilla canadensis* Sp. Pl. i. 498 (1753), it is evident that he adopted for the plant received from Arduino and published as *P. pensylvanica* (1767) a substitute-name which he thought to be equally appropriate.

With the type of *Potentilla pensylvanica* now settled, it becomes necessary to decide to what American species it belongs. I am unable, in the first place, to maintain as distinct species the plants kept up in the North American Flora as *P. pensylvanica* and *P. strigosa*. Others of the segregates seem to me conspecific but these, being later published, need not now concern us. The range of *P. pensylvanica*, as stated by Rydberg, has already been given. That of *P. strigosa* is amazingly similar, except for the inclusion of Asia: "Plains from Hudson Bay to Kansas, New Mexico, and British Columbia; also northern Asia, according to Lehmann."

Rydberg's *Potentilla pensylvanica* is keyed by him (N. Am. Fl.) under "Petioles and stem appressed-pubescent" and the fuller diagnosis says "stem . . . more or less appressed-pubescent and tomentulose" while in the parallel definitions (key and diagnosis) *P. strigosa* is under "Petioles and stem with spreading hairs" and "stems . . . with long spreading hairs." Pubescence of "long spreading hairs" is not what one would expect of a plant called *strigosa*, for *striga* was originally a swath of mowed hay or grain (lying flat) and in modern scientific terminology *strigae* are defined as "sharp close-pressed rigid hairs" (*Lindley*, Treas. Bot.), and the adjective strigose (*strigosus*) as "covered with strigae" (*Lindley*), "beset with appressed sharp straight and stiff hairs" (*Gray*) or "beset with sharp-pointed appressed straight and stiff hairs or bristles" (*Jackson*) [Italics mine].

In 1898, when he treated *Potentilla strigosa* as a variety of *P. pensylvanica*, Rydberg regarded "typical *P. Pennsylvanica* . . . a comparatively rare plant," while *P. pensylvanica*, var. *strigosa* was "the most common form of *P. Pennsylvanica*, found in the same range as the species." That the two are separated only by illusory differences is clearly indicated by some of the plates specially selected by Rydberg as illustrating them. The first synonym under Rydberg's *P. pensylvanica* (N. Am. Fl. p. 350) is *P. missourica* Hornem. in Lindl.

Bot. Reg. xvii. t. 1412 (1831). The plate is one of Hart's characteristic drawings and it is significant that the horizontally spreading or even slightly reflexed stiff hairs are shown uniformly on the stem, petiole and rachis. As an illustration of Rydberg's *P. pensylvanica* with "Petioles and stem appressed-pubescent" it is very contradictory; as an illustration of his *P. strigosa* with "Petioles and stem with spreading hairs" it would be thoroughly characteristic. The hairs shown on the plate of the type of *P. missourica* are positively divergent; those shown in the plate (Mem. Dept. Bot. Columbia Univ. ii. t. 38, fig. 2) selected to illustrate the plant "with spreading hairs" are not strongly spreading. The futility of trying to maintain two species, "found in the same range" and with no stronger difference than that emphasized in the North American Flora is apparent.

Returning to the question of what *Potentilla strigosa* really is, it becomes necessary to review the somewhat inconclusive history of the name. Pallas, the great explorer and early writer on the flora of Siberia, left an Asiatic specimen marked *Potentilla strigosa*. Pursh, taking up *P. pensylvanica* for the plant of "Canada and New England" (i. e. *P. pectinata*), found the specimen of the undefined *P. strigosa* Pallas in Lambert's herbarium, and taking it to be a variety of the plant of the eastern American coast, called it *P. pensylvanica*,

strigosa. β . *P. cano-pubescentis*; foliis pectinato-dentatis margine revolutis, floribus corymbosis.

P. strigosa. Pallas in *Herb. Lambert*.

Icon. *Gmel. sib. 3. t. 34. f. 1.*

..... β . on the Missouri.....

..... β . v. s. in *Herb. Lewis*.....

.....The variety β . appears to be a distinct species.¹

The plant of the Missouri, collected by Capt. Lewis and described by Pursh "cano-pubescentis" (not necessarily "with long spreading hairs") was supposed by Pursh to be the undescribed *P. strigosa* Pallas of Asia and the varietal name *P. pensylvanica*, β . *strigosa* Pursh consequently rests, at least in intent, partly upon the Siberian plant, which will now be checked. Pursh also cited a plate of a Siberian plant, one of Gmelin's very crude drawings which is not clearly referable by citation to any species discussed in Gmelin's text nor to anything North American. Regarding Gmelin's plate Trattinick specially commented: "Quoad iconem Gmelini et notas a Purshio tributas non potest esse eadem cum *P. pensylvanica*."² That element

¹ Pursh, *Fl. Am. Sept.* 356 (1814).

² Tratt. *Rosac. Mon.* iv. 31 (1824).

of Pursh's concept may be dismissed as having nothing to do with the plant of the Missouri which Pursh specially described.

The Pallas plant, *P. strigosa*, was formally recognized as a species (and thus validated) by Trattinnick in 1824. Trattinnick's treatment follows:

POTENTILLA *strigosa*. Pallas.

P. cano-pubescens; foliis pectinato-dentatis, margine revolutis, floribus corymbosis. Pursh.

Potentilla strigosa. Pall. in herb. Lambert.

Potentilla pensylvanica β . *strigosa*. Pursh. fl. Amer. sept. ed. 2. I. 356. Lehm. Potent. p. 55. Poir. Encycl. Suppl. IV. 543.

Potentilla foliis duplicato-pinnatis, venatis, valde exstantibus, subtus albicantibus, caule corymboso. Gmel. fl. sibir. III. p. 181. t. 34. f. 1.

Hab. in Sibiria, nec non ad Missurim fluvium in provincia Luisiana Amer. sept.

This account by Trattinnick, followed by the statement above quoted, that Gmelin's plate 34, fig. 1 does not belong to *Potentilla pensylvanica*, validly launched *P. strigosa* as a specific name. It is evident, however, that it was still as confused in the mind of Trattinnick as it had been with Pursh, but that Trattinnick made *P. strigosa* primarily Siberian. Many sheets of Asiatic plants distributed as *P. pensylvanica* or as *P. strigosa* are in the Gray Herbarium. About one half of those called *P. pensylvanica* are *P. chinensis* Seringe, the other half *P. niponica* Wolf; while the five sheets from the Altai sent out by Bunge and by Fischer as *P. strigosa* are quite unlike anything on our western plains.

If *Potentilla strigosa* Pallas is to be interpreted as the Siberian plant which Pallas had, then the name cannot be used for a wholly different North American species. If *P. strigosa* Pallas, first validly published as a species by Trattinnick in 1824, rests upon *P. pensylvanica* β . *strigosa* Pursh, of North America, it must not be overlooked that Pursh intentionally took the name from Pallas. At best the concept was from the start a confused one; to maintain the name *P. strigosa* Pallas for a strictly North American species would completely misinterpret Pallas's intention.

Chronologically, the next-published specific name for the characteristic plant of the Great Plains, which has been erroneously passing as *P. pensylvanica* and *P. strigosa* is *P. missourica* Hornem. in Lindl. Bot. Reg. xvii. t. 1412 (1831). This, although based on a very luxuriant garden specimen, is without question our plant. The name given by Horneman, without explanation, suggests that he was using it, correctly, because his species was that brought back by Capt.

Lewis from the Missouri and described by Pursh as *P. pensylvanica*, β . *strigosa*. The name *P. missourica* is unequivocal; and by those who see a specific line separating it from *P. pensylvanica* it should be used for the plant which Rydberg maintained as *P. strigosa*. As sufficiently emphasized, I can find no such line of cleavage.

POTENTILLA FRUTICOSA L., forma **villosissima**, f. nov. (TAB. 367), ramulis stipulis foliis utrinque dense albido-villosis, villis subsericiis; caulibus adscendentibus 3-6 dm. altis; foliis plerumque 5-foliolatis, foliolis ad 1.5 cm. longis.—ONTARIO: limestone pavement and gravel, Great Cloche Island, Manitoulin District, June 29, 1934, *Fernald & Pease*, no. 3382. (TYPE in Gray Herb.).

I hesitate to add to the many described forms of the polymorphic *Potentilla fruticosa*, especially since these numerous variations over the Northern Hemisphere have not been properly systematized. I can find none of the described variations, however, to which the extremely white-villous form of Great Cloche Island can be referred. That it is an ecological form rather than a geographically segregated variety is indicated by its passing very definitely on Great Cloche Island into the less villous or greenish-leaved shrub in the less xerophytic situations. Plate 367 shows typical branches, with an enlarged portion (FIG. 2) to illustrate the dense villosity.

P. SIMPLEX Michx. See Fern., RHODORA, xxxiii. 188, t. 215, fig. 1 (1931). ONTARIO: dry ledges along the river, Massey, no. 3383.

Known range in Ontario extended north from shores of Lakes Ontario and Erie.

GEUM LACINIATUM Murr. Comm. Novi. Gott. v. 30, t. 2 (1774); F. Bolle in Fedde, Repert. Beih. lxxii. 55 (1933). *G. virginianum*, var. *Murrayanum* Fern. RHODORA, xxv. 99 (1923).

Bolle, l. c. 71, points out that *Geum virginianum* L. was based on the very distinct southern species which has been known as *G. flavum* (Porter) Bicknell, Bull. Torr. Bot. Cl. xxiii. 523 (1896), a species which has the geographic advantage of occurring in Virginia, whereas the species which has been erroneously passing as *G. virginianum* apparently reaches its southeastern limit in Pennsylvania. In describing *G. virginianum* Linnaeus cited references from his earlier *Hortus Cliffortianus* and from Gronovius and Hermann, and, most fortunately, gave a new diagnosis based upon the material before him. The only specimen in the Linnean Herbarium definitely marked by Linnaeus "H. U. [Hortus Upsaliensis] *virginianum*," the specimen which must stand as the type, is shown in PLATE 368, made from a photograph supplied by Mr. S. Savage, Assistant Secretary of the

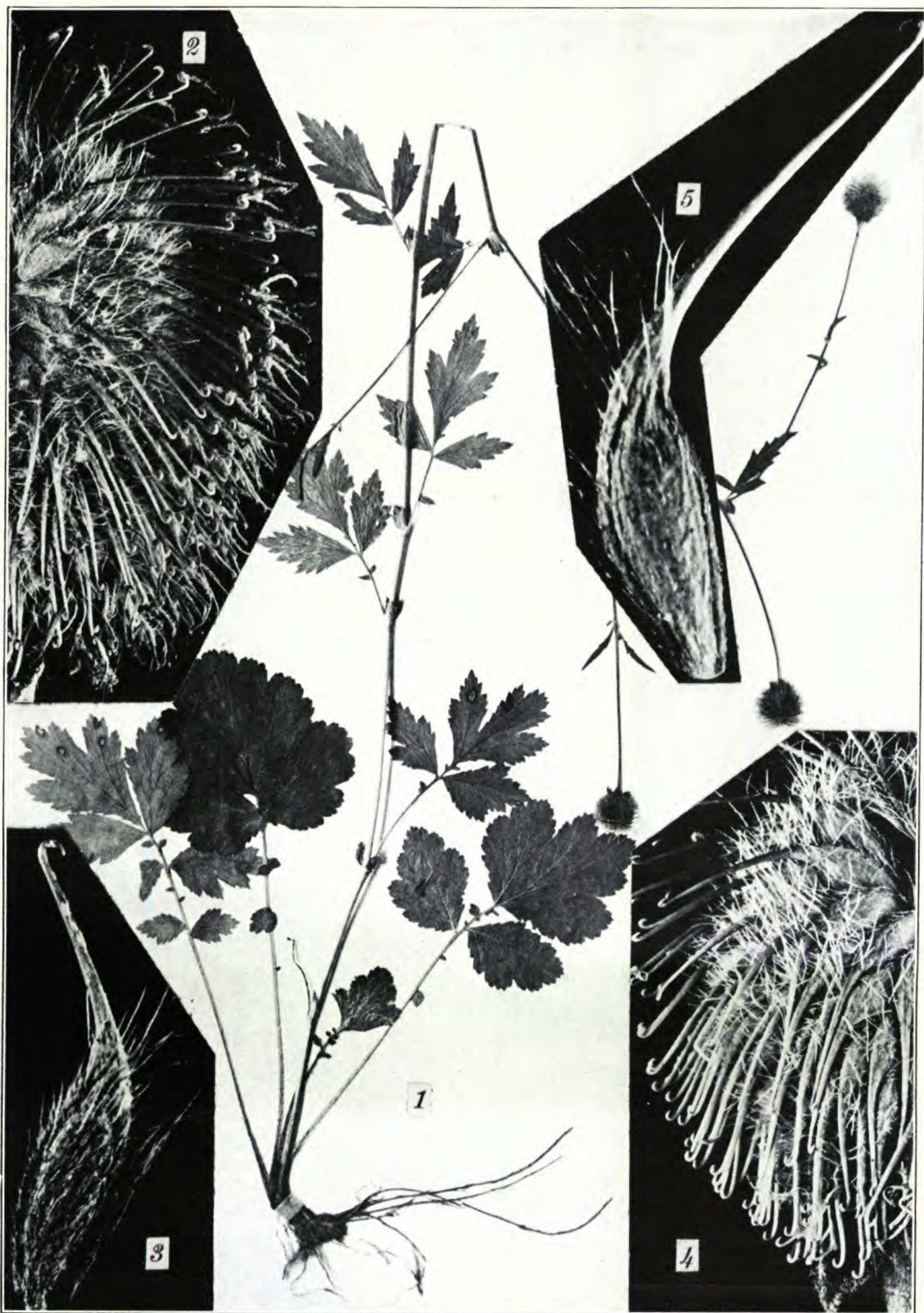


Photo. E. C. Ogden.

GEUM ALEPPICUM: FIG. 2, portion of fruiting head, showing villous achenes, $\times 4$, from Slovakia; FIG. 3, achene, $\times 10$, from East Prussia.

G. ALEPPICUM, var. *STRICTUM*: FIG. 1, small fruiting plant, $\times 1$, from Vermont; FIG. 4, portion of fruiting head, showing sparsely pubescent achenes, $\times 4$, from Nova Scotia; FIG. 5, achene, $\times 10$, from New Hampshire.

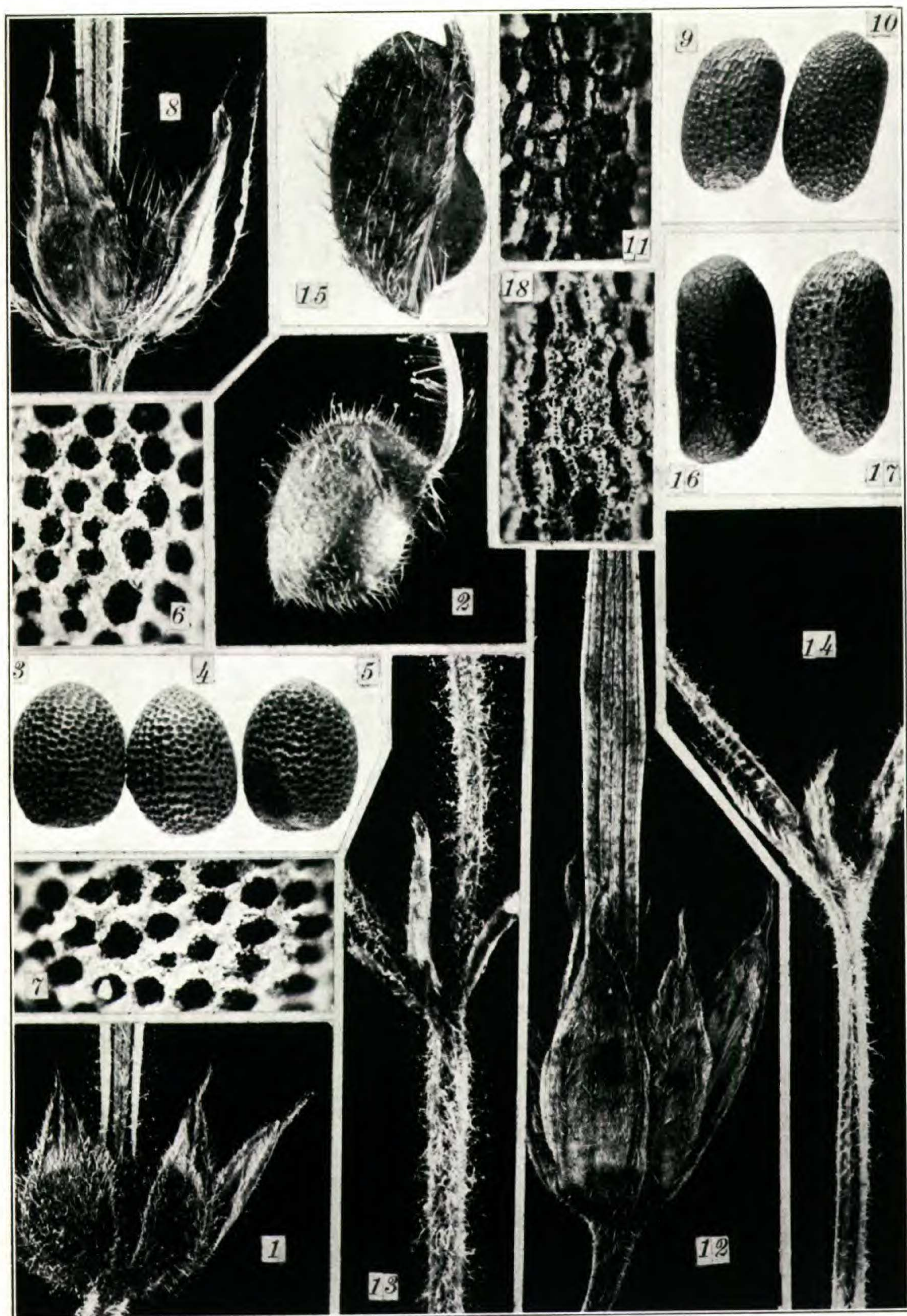


Photo. E. C. Ogden.

GERANIUM DISSECTUM: FIG. 1, calyx, $\times 5$, of *G. laxum*; FIG. 2, carpel-body, $\times 5$; FIG. 3, seed, $\times 10$, from Ireland; FIG. 4, seed, $\times 10$, from Oregon (*G. laxum*); FIG. 5, seed, $\times 10$, from North Carolina; FIG. 6, surface of seed, $\times 50$, from Ireland; FIG. 7, surface of seed, $\times 50$, of *G. laxum*.

G. BICKNELLII: FIG. 8, calyx, $\times 5$; FIGS. 9 and 10, seeds, $\times 10$; FIG. 11, surface of seed, $\times 50$.

G. BICKNELLII, var. *LONGIPES*: FIG. 12, calyx, $\times 5$; FIG. 13, peduncle and pedicel, $\times 10$, from TYPE; FIG. 14, peduncle and pedicel, $\times 10$, from ISOTYPE of *G. nemorale*; FIG. 15, carpel-body, $\times 5$; FIG. 16, seed, $\times 10$; FIG. 17, seed, $\times 10$; FIG. 18, surface of seed, $\times 50$.

Linnean Society of London. A second sheet, quite different from the first but pinned to it, was not marked by Linnaeus and, therefore, is not specially significant. The only plate cited by Linnaeus under *G. virginianum* (Hermann, *Paradisus Batavus*, t. 25), although much conventionalized, is not at all inconsistent with the type specimen, either in its characteristic foliage or in its elongate and lax branching. Gronovius gave no original diagnosis, merely copying that of Linnaeus in *Hortus Cliffortianus* and also the reference to Hermann which was also given by Linnaeus.

Since *Geum virginianum* proves to be quite distinct from the coarser and hirsute plant of broader continental range which we have been calling "*G. virginianum*," we must seek a name for the latter. The earliest name available seems to be *G. LACINIATUM* Murr., taken up by Bolle. Murray's plant, upon which I based *G. virginianum*, var. *Murrayanum*, has quite glabrous carpels and is generally of more northern range than the bristly-fruited plant which, in 1923, I mistook for typical *G. virginianum*. The latter should be called

G. LACINIATUM Murr., var. **trichocarpum**, var. nov., carpellis supra setosis.—TYPE: swampy woods, Franklin, Connecticut, August 22, 1914, *R. W. Woodward* in Gray Herb.

The variety occurs from Nova Scotia to Ontario (swale at base of gneiss hill, Markstay, Sudbury Distr., no. 3386), south to Pennsylvania and Missouri.

The common North American plant which with us is passing as *Geum strictum* Ait. Hort. Kew. i. 217 (1789) is so nearly identical with the Eurasian *G. aleppicum* Jacq. Ic. Pl. Rar. i. t. 93 (1781–1786) and Coll. i. 88 (1786) that the two, along with some others which often pass as local species, apparently represent one circumboreal and variable specific type. In Europe, recent authors (Ascherson & Graebner, Domin, Bolle) have been reducing the North American (and eastern Asiatic) *G. strictum* Ait. without qualification to *G. aleppicum*. Dr. Eric Hultén, however, maintains *G. strictum* tentatively, saying "The picture given by JACQUIN [our PLATE 369] shows a plant with radical leaves having large rounded slightly lobated terminal leaflet, and several European specimens of the corresponding plant also have similar large basal leaves. Our plant [*G. strictum*] usually has a three-cleft acutely serrated terminal leaflet on the radical leaves, but sometimes leaves occur resembling that illustrated by JACQUIN. They are then small and wither early. As our plant is apparently not quite identical with the European, I prefer to name it